



520
W656d

BOOK 520.W656D c.1
WILKINS # DISCOVERY OF WORLD IN
MOONE



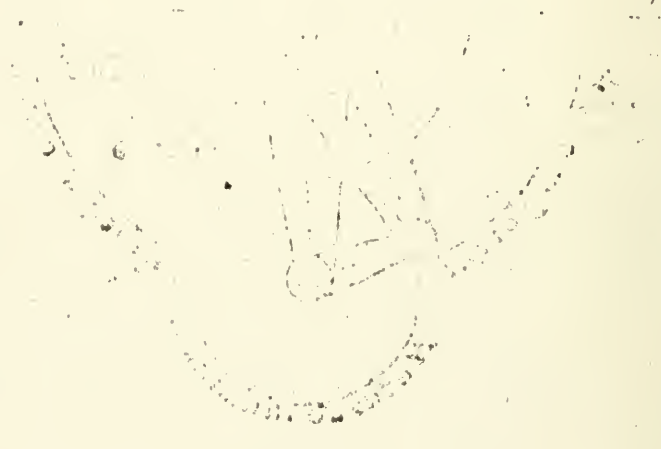
3 9153 00127550 4

THIS "O-P BOOK" IS AN AUTHORIZED REPRINT OF THE
ORIGINAL EDITION, PRODUCED BY MICROFILM-XEROGRAPHY BY
UNIVERSITY MICROFILMS, INC., ANN ARBOR, MICHIGAN, 1964

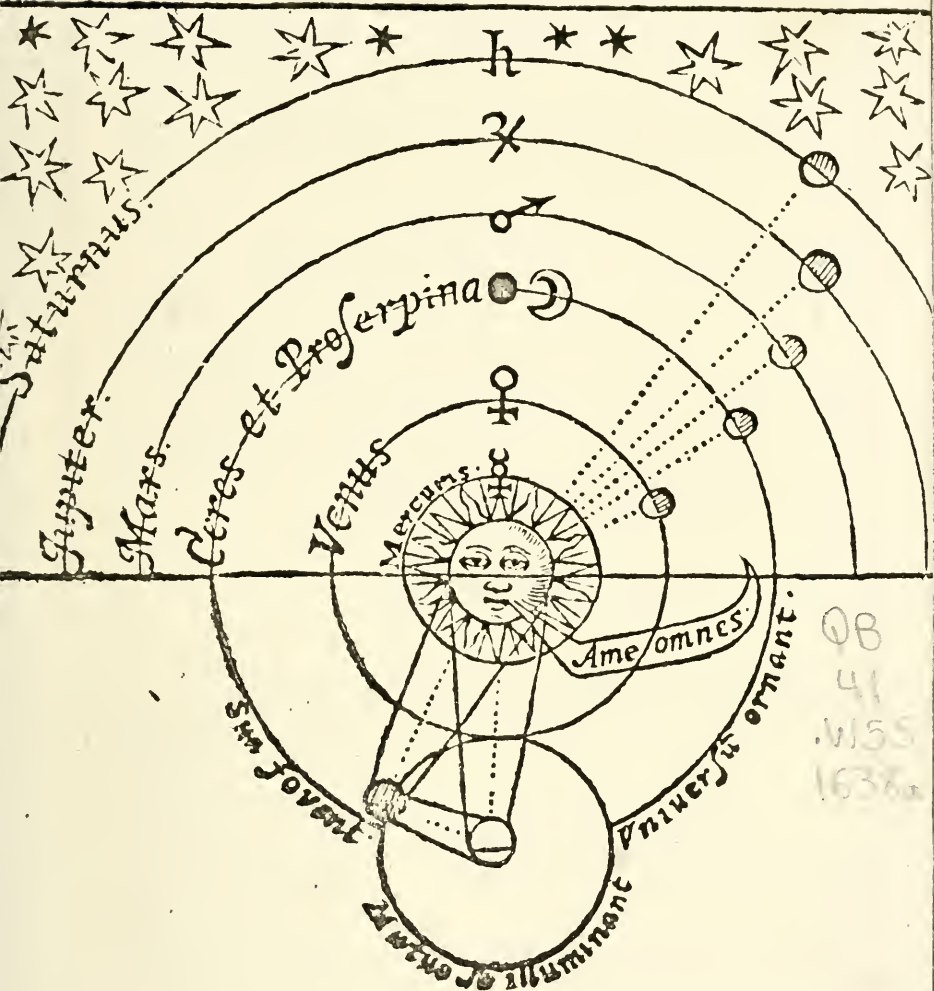
Discovery

1945

Yours most Obedient Son
of this Court and who is now
for his Court and who is now
poll of his Court and who is now



THE UNIVERSITY OF TORONTO
LIBRARY
CLARK VV
1911
1911



THE
DISCOVERY
OF A
WORLD
IN THE
MOONE.

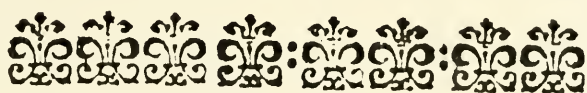
O R,
A DISCOVRSE

Tending
TO PROVE,
that 'tis probable there
may be another habitable
World in that Planet.

*Quid tibi inquis ista proderunt?
Si nihil aliud, hoc certè, sciam
omnia angusta esse. SENECA.
Præf. ad I. Lib. N. 2.*



LONDON,
Printed by E.G. for Michael Sparke
and Edward Forrest. 1638.



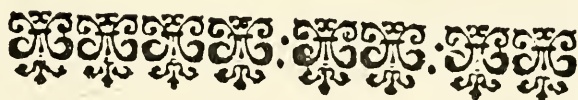
*Perlegi hæc παρὰδοξα &
novitatis graciâ ty-
pis mandari per-
mitto.*

Mart. 29. 1638.

THO. WEEKES R. P.

Episc. Lond. Cap.

Domest.





To the Reader.



I *F* amongst thy leisure
houres thou canst
spare any for the per-
usall of this discourse,
and dost looke to finde
somewhat in it which may serve for
thy information and benefit: let me
then advise thee to come unto it
with an equall minde, not swayed by
prejudice, but indifferently resolved
to assent unto that truth which
upon deliberation shall seeme most
probable unto thy reason, and then
I doubt not, but either thou wilt
agree with mee in this assertion, or
at least not thinke it to be as farre
from truth, as it is from common
opinion.

Two cautions there are which I
would willingly admonish thee of in
the beginning.

The Epistle

1. That then shouldst not here looke to find any exact, accurate Treatise, since this discourse was but the fruit of some lighter studies, and those too huddled up in a short time, being first thought of and finished in the space of some few weekes, and therefore you cannot in reason expect, that it should be so polished, as perhaps, the subject would require, or the leisure of the Author might have done it.
2. To remember that I promise onely probable arguments for the prooffe of this opinion, and therefore you must not looke that every consequence should be of an undeniable dependance, or that the truth of each argument should be measured by its necessity. I grant that some Astronomicall appearances may possibly be solved otherwise then here they are. But the thing I aime at is this, that probably they may so be solved, as I have here set them downe: Which, if it be granted (as I thinke it must) then I doubt

to the Reader.

doubt not, but the indifferent reader will find some satisfaction in the main thing that is to be proved.

Many ancient Philosophers of the better note, have formerly defended this assertion, which I have here laid downe, and it were to be wished, that some of us would more apply our endeavours unto the examination of these old opinions, which though they have for a long time lien neglected by others, yet in them may you finde many truths well worthy your paines and observation. Tis a false conceit, for us to thinke, that amongst the ancient variety and search of opinions, the best hath still prevailed. Time (saith the learned Verulam) seemes to be of the nature of a river or streame, which carrieth downe to us that which is light, or blowne up, but sinketh that which is weighty and solid.

It is my desire that by the occasion of this discourse, I may raise up some more active spirit to a search
after

The Epistle, &c.

after other hidden and unknowne truths. Since it must needs be a great impediment unto the growth of sciences, for men still so to plod on upon beaten principles, as to be afraid of entertaining any thing that may seeme to contradict them. An unwillingnesse to take such things into examination, is one of those errors of learning in these times observed by the judicious Verulam. Questionlesse there are many secret truths, which the ancients have passed over, that are yet left to make some of our age famous for their discovery.

If by this occasion I may provoke any reader to an attempt of this nature, I shall then thinke my selfe happy, and this worke successfull.

Farewell.



The First Proposition, by way of Preface.

That the strangenesse of this opinion is no sufficient reason why it should be rejected, because other certaine truths have beene formerly esteemed ridiculous, and great absurdities entertayned by common consent.



Here is an earnestnesse and hungering after novelty, which doth still adhere unto all our natures, and it is part of that primative image, that wide extent and infinite capacity at first created in the heart of man, for this since its depravation in

B

Adam

Adam perceiving it selfe altogether emptied of any good doth now catch after every new thing, conceiving that possibly it may finde satisfaction among some of its fellow creatures. But our enemy the divell (who strives still to pervert our gifts, and beate us with our owne weapons) hath so contriv'd it, that any truth doth now seeme distastefull for that very reason, for which error is entertain'd-- Novelty, for let but some upstart heresie be set abroach, and presently there are some out of a curious humour; others, as if they watched an occasion of singularity, will take it up for canonicall, and make it part of their creede and profession; - whereas solitary truth cannot any where finde so ready entertainment; but the same Novelty which is esteemed the commendation of error and makes that acceptable, is counted the fault of

of truth, and causes that to be rejected. How did the incredulous World gaze at *Columbus* when hee promised to discover another part of the earth, and he could not for a long time by his confidence, or arguments, induce any of the Christian Princes, either to assent unto his opinion, or goe to the charges of an experiment. Now if he who had such good grounds for his assertion, could finde no better entertainment among the wiser sort, and upper end of the World; 'tis not likely then that this opinion which I now deliver, shall receive any thing from the men of these daies, especially our vulgar wits, but misbelieve or derision. It hath alwaies beene the unhappinesse of new truths in Philosophy, to be derided by those that are ignorant of the causes of things, and rejected by others whose perverseness ties them to the con-

Mytholog.
lib. 3. c. 17.

trary opinion, men whose envious pride will not allow any new thing for truth which they themselves were not the first inventors of. So that I may iustly expect to be accused of a pragmaticall ignorance, and bold ostentation, especially since for this opinion *Xenophanes*, a man whose authority was able to adde some credit to his assertion could not escape the like censure from others. For *Natales Comes* speaking of that Philosopher, and this his opinion, saith thus, *Nonnulli ne nihil scisse videantur, aliqua nova monstra in Philosophiã introducunt, ut alicujus rei inventores fuisse appareant.* Some
 “ there are who least they might
 “ seeme to know nothing, will
 “ bring up monstrous absurdities in Philosophy, that so afterward they may bee famed
 “ for the invention of somewhat. The same author doth also in another place accuse *Anaxagoras* of

Lib. 7. c. 1.

of folly for the same opinion,
Est enim non ignobilis gradus stultitiae, vel si nescias quid dicas, tamen velle de rebus propositis hanc vel illam partem stabilire.

“Tis none of the worst kindes of folly, boldly to affirme one side or other, when a man knows not what to say.

If these men were thus censur'd, I may iustly then expect to be derided by most, and to be believed by few or none; especially since this opinion seemes to carry in it so much strangeness, so much contradiction to the generall consent of others. But how ever, I am resolved that this shall not be any discouragement, since I know that it is not the common opinion of others that can either adde or detract from the truth. For,

1. Other truths have beene formerly esteemed altogether as ridiculous as this can be.

- 2 Große absurdities have
beene entertained by ge-
nerall opinion.

I shall give an instance of each,
that so I may the better prepare
the Reader to consider things
without a prejudice, when hee
shall see that the common op-
position against this which I
affirme cannot any way dero-
gate from its truth.

1. Other truths have beene
formerly accounted as ridicu-
lous as this, I shall specifie that
of the Antipodes, which have
beene denied and laught at by
many wise men and great Schol-
lers, such as were *Herodotus*, *St.*
Austin, *Lucretius*, the *Venerable*
Bede, *Lucretius* the Poet, *Procopi-*
us, and the voluminous *Abulen-*
sis with others. *Herodotus* coun-
ted it so horrible an absurdity,
that hee could not forbear
laughing to thinke of it. *Γελῶ δὲ*
ἐφ' ὧν γῆς περὶ ὅδους γεῖψαντας, πολλὰς

ἦδη καὶ ἐδὲνα νόον ἔχοντας ἐξηγησάμενον
οἱ ὦ κακόν τε βέοντα γράφουσιν, πείει πῶ
τε γλῶ ἔβου κυκλοτερέα ὡς ἀπὸ πόρου.

“ I cannot choose but laugh,
“ (saith he) to see so many men
“ venture to describe the earths
“ compasse, relating those things
“ that are without all sense, as
“ that the Sea flowes about the
“ World, and that the earth it
“ selfe is round as an Orbe. But
this great ignorance is not so
much to be admired in him, as
in those learned men of later
times, when all sciences began
to flourish in the World. Such
was Saint *Austin* who censures
that relation of the Antipodes
to be an incredible fable, and
with him agrees the eloquent
Lactantius, *quid illi qui esse con-*
trarios vestigiis nostris Antipodes
putant? num aliquid loquuntur?
aut est quispiam tam ineptus, qui
credat esse homines, quorum vesti-
gis sunt superiora quàm capita?
aut ibi quæ apud nos jacent inver-

De civit.
Dei. lib. 16.
cap. 9.

Instit. l. 3.
c. 24.

ſapendere ? fruges & arbores deor-
ſum verſus creſcere, pluuias & ni-
ves, & grandinem ſurſum verſus
cadere in terram ? & miratur
aliquis hortos penſiles inter ſeptem
mira narrari, quum Philoſophi, &
agros & maria, & urbes & montes
penſiles faciunt ? &c. What (ſaith
 “ he) are they that thinke there
 “ are Antipodes, ſuch as walke
 “ with their feet againſt ours ?
 “ doe they ſpeake any likely-
 “ hood ? or is there any one ſo
 “ fooliſh as to believe that there
 “ are men whoſe heeles are high-
 “ er than their heads ? that
 “ things which with us doe lie
 “ on the ground doe hang there ?
 “ that the Plants and Trees
 “ grow downewards, that the
 “ haile, and raine, and ſnow fall
 “ upwards to the earth ? and
 “ doe wee admire the hanging
 “ Orchards amongſt the ſeven
 “ wonders, whereas here the
 “ Philoſophers have made the
 “ Field and Seas, the Cities and
 Moun-

“Mountaines hanging. What
 “shall wee thinke (saith hee in
Plutarch) that men doe clyng
 to that place like wormes, or
 hang by their clawes as Cats, or
 if wee suppose a man a little
 beyond the Center, to bee dig-
 ging with a spade? is it like-
 ly (as it must bee according to
 this opinion) that the earth
 which hee loosened, should of
 it selfe ascend upwards? or else
 suppose two men with their
 middles about the center, the
 feete of the one being placed
 where the head of the other is,
 and so two other men crosse
 them, yet all these men thus si-
 tuated according to this opini-
 on should stand upright, and
 many other such grosse conse-
 quences would follow (saith
 hee) which a false imagination
 is not able to fancy as possible.
 Upon which considerations,
Bede also denies the being of any
 Antipodes, *Neg enim Antipoda-*

*De ratione
 temporum,
 Cap. 32.*

~~non nullatenus~~ est Fabulis accommo-
dandus assensus, Nor should wee
“any longer assent to the Fable
“of Antipodes. So also *Lucretius*
the Poet speaking of the same
subject, sayes :

*De nat. ve-
rum, lib. I.*

Sed vanus solidis hæc omnia finxerit error.

*Comment. in
I. Cap. Gen.*

That some idle fancy faigned
these for fooles to believe. Of
this opinion was *Procopius Ga-
zæus*, but he was perswaded to it
by another kinde of reason ; for
he thought that all the earth un-
der us was sunke in the water,
according to the saying of the
Psalmist, Hee hath founded the
Earth upon the Seas, and there-
fore hee accounted it not inhabi-
ted by any. Nay *Testatus* a man
of later yeeres and generall lear-
ning doth also confidently deny
that there are any such Antipo-
des, though the reason which hee
urges for it bee not so absurde as
the former, for the Apostles, saith
hee, travelled through the whole
habi-

Psal. 24. 2.

*Comment. in
I. Genes.*

habitable world, but they never passed the Equinoctiall; and if you answer that they are said to goe through all the earth, because they went through all the knowne world, hee replies, that this is not sufficient, since Christ would have all men to be saved, and come to the knowledge of his truth, and therefore 'tis requisite that they should have travelled thither also, if there had been any inhabitants, especially since he did expressely command them to goe and teach all nations, and preach the Gospell through the whole world, and therefore he thinks that as there are no men, so neither are there seas, or rivers, or any other conveniency for habitation: 'tis commonly related of one *Virgilius*, that he was excommunicated and condemned for a Heretique by *Zachary* Bishop of *Rome*, because hee was not of the same opinion. But

Baryngius

1 Tim. 2.4.

Mat. 28.19

*Annal. Ec-
cles. A. D.
748.*

Baronius saies, it was because hee thought there was another habitable world within ours. However, you may well enough discern in these examples how confident many of these great Schollars were in so grosse an error, how unlikely, what an incredible thing it seemed to them, that there should be any Antipodes, and yet now this truth is as certaine and plaine, as sense or demonstration can make it. This then which I now deliver is not to be rejected, though it may seeme to contradict the common opinion.

2. Grosse absurdities have beene entertained by generall consent. I might instance in many remarkable examples, but I will onely speake of the supposed labour of the Moone in her eclipses, because this is neereest to the chiefe matter in hand, and was received as a common opinion amongst many

asleepe, when one of its eyes began to winke, and therefore they would doe what they could by loud sounds to rouse it from its drowfinesse, and keepe it awake by bright torches, to bestow that light upon it which it began to lose. Some of them thought hereby to keepe the Moone in her orbe, whereas otherwise she would have fallen downe upon the earth, and the world would have lost one of its lights, for the credulous people believed, that Inchanters, and Witches could bring the Moone downe, which made *Virgil* say,

*Lego
Columna*

Carthus & è cælo possunt deducere Lunam.

And those Wizards knowing the times of her eclipses, would then threaten to shew their skill, by pulling her out of her orbe. So that when the silly multitude saw that she began to looke red, they presently feared they should lose the benefit of her light, and therefore made a great noise that she

she might not heare the sound of those Charmes, which would otherwise bring her downe, and this is rendered for a reason of this custome by *Pliny* and *Propertius*:

*Cantus & è curru lunam deducere tentant,
Et facerent, si non ara repulsa sonent.*

leg. Latina

Nat. hist.

lib. 2. c. 12.

Plutarch gives another reason of it, and he sayes, 'tis because they would hasten the Moone out of the darke shade wherein shee was involv'd, that so she might bring away the soules of those Saints that inhabit within her, which cry out by reason they are then deprived of their wonted happinesse, and cannot heare the musicke of the Spheares, but are forced to behold the torments, and wailing of those damned soules which are represented to them as they are tortured in the region of the aire, but whether this or what ever else was the meaning of this superstition, yet certainly 'twas a very ridiculous custome,

stome, and bewrayed a great ignorance of those ancient times, especially since it was not onely received by the vulgar, such as were men of lesse note and learning, but believed also, by the more famous and wiser sort, such as were those great Poets, *Stesichorus* and *Pindar*. And not onely amongst the more sottish heathens, who might account that Planet to be one of their Gods, but the primitive Christians also were in this kinde guilty; which made S. *Ambrose* so tartly to rebuke those of his time, when he said, *Tum turbatur carminibus Globus Lune, quando calicibus turbamur & oculi*. When
 “ your heads are troubled with
 “ cups, then you thinke the
 “ Moone to be troubled with
 “ charmes.

*Turinens.
Episc.*

And for this reason also did *Maximus* a Bishop, write a Homily against it, wherein hee shewed the absurditie of that foolish

foolish superstition. I remember, that *Ludovicus Vives* relates a more ridiculous story of a people that imprisoned an Asse for drinking up the Moone, whose image appearing in the water was covered with a cloud, as the Asse was drinking, for which the poore beast was afterward brought to the barre to receive a sentence according to his deserts, where the grave Senate being set to examine the matter, one of the Counsell (perhaps wiser than the rest) rises up, and out of his deepe judgement, thinkes it not fit that their Towne should lose its Moone, but that rather the Asse should be cut up, and that taken out of him; which sentence being approved by the rest of those Politicians, as the subtillest way for the conclusion of the matter was accordingly performed. But whether this tale were true or no I will not question, how-

ever there is absurdity enough in that former custome of the ancients, that may confirme the truth to be proved, and plainly declare the insufficiency of common opinion to adde true worth or estimation unto any thing. So that from that which I have said may be gathered thus much.

1. That a new truth may seeme absurd and impossible not onely to the vulgar, but to those also who are otherwise wise men, and excellent scholars; and hence it will follow, that every new thing which seemes to oppose common Principles is not presently to be rejected, but rather to be pry'd into with a diligent enquiry, since there are many things which are yet hid from us, and reserv'd for future discovery.

2. That it is not the commonnesse of an opinion that can priviledge it for a truth, the
wrong

wrong way is sometime a well beaten path, whereas the right way (especially to hidden truths) may bee lesse trodden and more obscure.

True indeed, the strangeness of this opinion will detract much from its credit; but yet we should know that nothing is in its selfe strange, since every naturall effect has an equall dependance upon its cause, and with the like necessity doth follow from it, so that 'tis our ignorance which makes things appeare so, and hence it comes to passe that many more evident truths seeme incredible to such who know not the causes of things : you may as soone perswade some Country peasants that the Moone is made of greene Cheese (as wee say) as that 'tis bigger than his Cart-wheele, since both seeme equally to contradict his sight, and hee has not reason enough to leade him farther than

his senses. Nay, suppose (saith *Plurarch*) a Philosopher should be educated in such a secret place, where hee might not see either Sea or River, and afterwards should be brought out where one might shew him the great Ocean telling him the quality of that water, that it is blackish, salt, and not potable, and yet there were many vast creatures of all formes living in it, which make use of the water as wee doe of the aire, questionlesse he would laugh at all this, as being monstrous lies & fables, without any colour of truth. Just so will this truth which I now deliver appeare unto others; because we never dreamt of any such matter as a world in the Moone, because the state of that place hath as yet been vailed from our knowledge, therefore wee can scarcely assent to any such matter. Things are very hardly received which are altogether
strange

strange to our thoughts and our senses. The soule may with lesse difficulty be brought to believe any absurdity, when as it has formerly beene acquainted with some colours and probabilities for it, but when a new, and an unheard of truth shall come before it, though it have good grounds and reasons, yet the understanding is afraid of it as a stranger, and dares not admit it into its beliefe without a great deale of reluctancy and tryall. And besides things that are not manifested to the senses, are not assented unto without some labour of mind, some travaile and discourse of the understanding, and many lazie soules had rather quietly repose themselves in an easie error, then take paines to search out the truth. The strangeness then of this opinion which I now deliver will be a great hinderance to its beliefe, but this is not to be re-

1686

spected by reason it cannot be helped. I have stood the longer in the Preface, because that prejudice which the meere title of the booke may beget cannot easily be removed without a great deale of preparation, and I could not tell otherwise how to rectifie the thoughts of the Reader for an impartiall survey of the following discourse.

I must needs confesse, though I had often thought with my selfe that it was possible there might be a world in the Moone, yet it seemed such an uncouth opinion that I never durst discover it, for feare of being counted singular and ridiculous, but afterward having read *Plurarch*, *Galileus*, *Keplar*, with some others, and finding many of mine owne thoughts confirmed by such strong authority, I then concluded that it was not onely possible there might bee, but probable that there was another habi-

habitable world in that Planet. In the prosecuting of this assertion, I shall first endeavour to cleare the way from such doubts as may hinder the speed or ease of farther progresse; and because the suppositions imply'd in this opinion may seeme to contradict the principles of reason or faith, it will be requisite that I first remove this scruple, shewing the conformity of them to both these, and proving those truths that may make way for the rest, which I shall labour to performe in the second, third, fourth, and fifth Chapters, and then proceede to confirme such Propositions, which doe more directly belong to the maine point in hand.

Proposition 2.

*That a plurality of worlds doth not
contradict any principle of rea-
son or faith.*

Is reported of *Aristotle* that when hee saw the bookes of *Moses* he commended them for such a majesticke stile as might become a God, but withall hee censured that manner of writing to be very unfitting for a Philosopher because there was nothing proved in them, but matters were delivered as if they would rather command than perswade believe. And 'tis observed that hee sets downe nothing himselfe, but he confirms it by the strongest reasons that may be found, there being scarce an argument of force for any subject in Philosophy which may not bee picked out of his

his writings, and therefore 'tis likely if there were in reason a necessity of one onely world, that hee would have found out some such necessary prooffe as might confirme it : Especially since hee labours for it so much in two whole Chapters. But now all the arguments which he himselfe urges in this subject, are very weake and farre enough from having in them any convincing power. Therefore 'tis likely that a plurality of worlds doth not contradict any principle of reason. However, I will set downe the two chiefe of his arguments from his owne workes, and from them you may guesse the force of the other. The 1 is this, since every heavy body doth naturally tend downwards, and every light body upwards, what a hudling and confusion must there bee if there were two places for gravity and two places for lightnesse : for it is

De Cælo
l. 1. c. 8. 9.

Ibid.

is probable that the Earth of that other World would fall downe to this Center, and so mutually the aire and fire here ascend to those Regions in the other, which must needes much derogate from the providence of nature, and cause a great disorder in his workes. To this I answered, that if you will consider the nature of gravity, you will plainely see there is no ground to feare any such confusion, for heaviness is nothing else but such a quality as causes a propension in 'its subject to tend downewards towards its owne Centre, so that for some of that earth to come hither would not bee said a fall but an ascension, since it moved from its owne place, and this would bee impossible (saith *Ruvius*) because against nature, and therefore no more to bee feared than the falling of the Heavens.

De Cælo

Li. 6. 9. 9. 1.

Another

Another Argument hee had from his master *Plato*, that there is but one World, because there is but one first mover, God.

But here I may deny the consequence, since a plurality of worlds doth not take away the unity of the first mover. *Utrum forma substantialis, sic primum efficiens apparentem solummodo multipliciter induit per signatam materiam* (saith a Countrey-man of ours.) As the substantiall forme, so the efficient cause hath onely an appearing multiplicity from its particular matter. You may see this point more largely handled, and these Arguments more fully answered by *Plutarch* in his Booke (why Oracles are silent) and *Jacob Carpentarius* in his comment on *Alcinous*.

But our opposites the Interpreters themselves, (who too often doe *jurare in verba magistri*) will grant that there is not any strength

Metaphys.
l. 12. c. 8.
Diog. Laert.
lib. 3.

Nic. Hill. de
Philosop.
Epic. partic.
379.

strength in these consequences, and certainly their such weak arguments could not convince that wise Philosopher, who in his other opinions was wont to bee swayed by the strength and power of reason: wherefore I should rather thinke that he had some by-respect, which made him first assent to this opinion, and afterwards strive to prove it. Perhaps it was because hee feared to displease his scholler *Alexander*, of whom 'tis related that he wept to heare a disputation of another world, since he had not then attained the Monarchy of this, his restless wide heart would have esteemed this Globe of Earth not big enough for him, if there had beene another, which made the Satyrist say of him,

*Platarch. de
t. ang. anim.*

Idem.

Æstuat infelix angusto limite mundi.

“ That he did vexe himselfe and
 “ sweate in his desires, as being
 “ pend up in a narrow roome,
 when

“when hee was confin’d but to
“one world. Before he thought
to seate himselſe next the Gods,
but now when hee had done his
best, hee must be content with
some equall, or perhaps superi-
our Kings.

It may be, that *Aristotle* was
moved to this opinion, that hee
might thereby take from *Alexan-
der* the occasion of this feare and
discontent, or else, perhaps,
Aristotle himselſe was as loth to
hold the possibility of a world
which he could not discover, as
Alexander was to heare of one
which he could not conquer.
Tis likely that some such by-re-
spect moved him to this opini-
on, since the arguments he urges
for it are confest by his zealous
followers and commentators, to
be very sleight and frivolous, and
they themselves grant, what I am
now to prove, that there is not
any evidence in the light of na-
turall reason, which can suffici-
ently

ently manifest that there is but one world.

But however some may object, would it not be inconvenient and dangerous to admit of such opinions that doe destroy those principles of *Aristotle*, which all the world hath so long followed?

*Apologia pro
Galileo.*

This question is much controverted by the *Romish* Divines; *Campanella* hath writ a Treatise in defence of it, in whom you may see many things worth the reading and notice.

*Ethic. l. 1.
c. 6.*

To it I answer, that this position in Philosophy, doth not bring any inconvenience to the rest, since tis not *Aristotle*, but truth that should be the rule of our opinions, and if they be not both found together, wee may say to him, as hee said to his Master *Plato*, ἀμφοῖν γὰρ ὄντων φίλον, ὅσον ἐσθιμὴν πλεονάζουσαν. Though
 “ *Plato* were his friend, yet hee
 “ would rather adhere to truth
 than him. I

I must needs grant, that wee are all much beholden to the industry of the ancient Philosophers, and more especially to *Aristotle*, for the greater part of our learning, but yet tis not ingratitude to speake against him, when hee opposeth truth; for then many of the Fathers would be very guilty, especially *Iustin*, who hath writ a Treatise purposely against him.

But suppose this opinion were false, yet 'tis not against the faith, and so it may serve for the better confirmation of that which is true; the sparkes of error, being forc'd out by opposition, as the sparkes of fire, by the striking of the flint and Steele. But suppose too that it were hereticall, and against the faith, yet may it be admitted with the same priviledge as *Aristotle*, from whom many more dangerous opinions have proceeded: as that the world is eternall,

eternall, that God cannot have while to looke after these inferiour things, that after death there is no reward or punishment, and such like blasphemies, which strike directly at the fundamentalls of our Religion.

So that it is justly to be wondered why some should be so superstitious in these daies, as to sticke closer unto him, than unto Scripture, as if his Philosophy were the onely foundation of all divine truths.

Upon these grounds both *St. Vincentius* and *Senafinus de firmo* (as I have seene them quoted) thinke that *Aristotle* was the viol of Gods wrath, which was powdered out upon the waters of Wisdom by the third Angel; But for my part, I thinke the world is much beholden to *Aristotle* for all it sciences. But yet twere a shame for these later ages to rest our selves meerely upon the labours of our Fore-fathers,

as

Rev. 16. 4.

as if they had informed us of all things to be knowne, and when wee are set upon their shoulders, not to see further then they themselves did. 'Twere a superstitious, a lazie opinion to thinke *Aristotles* workes the bounds and limits of all humane invention, beyond which there could be no possibility of reaching. Certainly there are yet many things left to discovery, and it cannot be any inconvenience for us, to maintaine a new truth, or rectifie an ancient error.

But the position (say some) is directly against Scripture, for

1. *Moses* tells us but of one world, and his History of the creation had beene very imperfect if God had made another.

2. Saint *John* speaking of Gods workes, saies he made the world, in the singular number, and therefore there is but one: 'tis the argument of *Aquinas*, and he thinks that none will oppose it, but such

D

who

Part 1. Q.
47. Art. 3.

who with *Democritus* esteeme
so ne blinde chance, and not any
wise providence to be the framer
of all things.

3. The opinion of more worlds
has in ancient time beene account-
ed a heresie, and *Baronius* affirms
that for this very reason, *Virgilius*
was cast out of his Bishopricke,
and excommunicated from the
Church.

Anna! Eccl.
A. D. 748.

4. A fourth argument there is
urged by *Aquinas*, if there be
more worlds than one, then they
must either be of the same, or of a
diverse nature, but they are not of
the same kinde, for this were
needlesse, and would argue an im-
providence, since one would have
no more perfection than the other;
not of divers kinds, for then one
of them could not be called the
world or universe, since it did not
containe universall perfection, I
have cited this argument, because
it is so much stood upon by *Julius*
Cesar la Galla, one that has pur-
posely

Ibid.

De Phenom
in orbem luxæ.

posely writ a Treatise against this opinion which I now deliver, but the Dilemma is so blunt, that it cannot cut on either side, and the consequences so weake, that I dare trust them without an answer; And (by the way) you may see this Author in that place, where he endeavours to prove a necessity of one world; doth leave the chiefe matter in hand, and take much needlesse paines to dispute against *Democritus*, who thought that the world was made by the casual! concourse of *atoms* in a great *vacuum*. It should seeme, that either his cause, or his skill was weake, or else he would have ventured upon a stronger adversary. These arguments which I have set downe, are the chiefeest which I have met with against this subject, and yet the best of these hath not force enough to endanger the truth that I have delivered.

Unto the two first it may be

D 2 answered,

answered, that the negative authority of Scripture is not prevalent in those things which are not the fundamentalls of Religion.

But you'le reply, though it does not necessarily conclude, yet 'tis probable if there had beene another world, wee should have had some notice of it in Scripture.

I answer, 'tis as probable that the Scripture should have informed us of the Planets they being very remarkable parts of the Creation, and yet neither *Moses* nor *Job*, nor the *Psalmes* (the places most frequent in Astronomicall observations) mention any of them but the Sunne and Moone, and moreover, you must know, that 'tis besides the scope of the Holy Ghost either in the new Testament or in the old, to reveale any thing unto us concerning the secrets of Philosophy; 'tis not his intent in the new Testament, since
we

we cannot conceive how it might any way belong either to the Historically exegetical or prophetical parts of it : nor is it his intent in the old Testament, as is well observed by our Countrey-man Master WRIGHT. *Non Moses aut Prophetarum institutum fuisse videtur Mathematicas aliquas aut Physicas subtilitates promulgare, sed ad vulgi caput & loquendi morem quemadmodum nutrices infantulis solent sese accommodare.*

*Epist. ad
In
Gilbert.*

“Tis not the endeavour of Moses
“or the Prophets to discover any
“Mathematicall or Philosophicall
“subtilties, but rather to accommo-
“date themselves to vulgar capa-
“cities, and ordinary speech, as
“nurses are wont to use their
infants. True indeede, *Moses* is
there to handle the history of the
Creation, but ’tis observed that he
does not any where meddle with
such matters as were very hard to
be apprehended, for being to in-
forme the common people as well

Part I. Q.
68. Art. 3.

Gen. I. 16.

anglies (from
y. cat. Ang. 166.)

as others, he does it after a vulgar way, as it is commonly noted, declaring the originall chiefly of those things which were obvious to the sense, and being silent of other things, which then could not well be apprehended. And therefore *Aquinas* observes, that *Moses* writes nothing of the aire, because that being invisible, the people knew not whether there were any such body or no. And for this very reason *Saint Austin* also thinkes that there is nothing exprest concerning the creation of Angels which notwithstanding are as remarkable parts of the creatures, and as fit to be knowne as another world. And therefore the Holy Ghost too uses such vulgar expressions which set things forth rather as they appeare, then as they are, as when he calls the Moone one of the greater lights מאור הגדול whereas 'tis the least, but one that wee can see in the whole heavens.

So afterwards speaking of the great raine which drowned the world, he saies, the windowes of heaven were opened, because it seemed to come with that violence, as if it were, poured out from windows in the Firmament. So that the phrases which the Holy Ghost uses concerning these things are not to be understood in a literall sense; but rather as vulgar expressions, and this rule is set downe by Saint *Austin*, where speaking concerning that in the Psalme, *who stretched the earth upon the waters*, hee notes, that when the words of Scripture shall seeme to contradict common sense or experience, there are they to be understood in a qualified sense, and not according to the letter. And 'tis observed that for want of this rule, some of the ancients have fastened strange absurdities upon the words of the Scripture. So Saint *Ambrose* esteemed it a heresie, to thinke, that the Sunne

Gen. 11.

St. *Aug. Remy*
c. 7. §. 6.

1. 2. in Gen.
Psal. 136. 6.

Wisd. 2. 4.

17. 5.

Ecclus. 43.

3. 4.

Com. inc. 1.

Gen.

and starres were not very hot, as being against the words of Scripture, *Psal. 19. 6.* where the *Psalmist* sayes that there is nothing that is hid from the heate of the Sunne. So others there are that would prove the heavens not to be round, out of that place, *Psal. 104. 2.* *Hee stretcheth out the heavens like a curtaine.* So *Procopius* also was of opinion, that the earth was founded upon the waters, nay, he made it part of his faith, proving it out of *Psal. 24. 2.* *Hee hath founded the earth upon the seas, and established it upon the floods.* These and such like absurdities have followed, when men looke for the grounds of Philosophie in the words of Scripture. So that from what hath beene said, I may conclude that the silence of Scripture concerning any other world is not sufficient argument to prove that there is none. Thus for the two first arguments.

Unto the third, I may answer, that this very example is quoted by others, to shew the ignorance of those primative times, who did sometimes condemne what they did not understand, and have often censur'd the lawfull & undoubted parts of Mathematicques for hereticall, because they themselves could not perceive a reason of it, and therefore their practise in this particular, is no sufficient testimony against us.

But lastly I answer to all the above named objections, that the terme World, may be taken in a double sense, more generally for the whole Universe, as it implies in it the elementary and æthereall bodies, the starres and the earth. Secondly, more particularly for an interior World consisting of elements. Now the maine drift of all these arguments, is to confute a plurality of worlds in the first sense, and if there were any such, it might, perhaps, seeme strange, that

that *Moses*, or *St. John* should either not know, or not mention its creation. And *Virgilius* was condemned for this opinion, because he held, *quod sit alius mundus sub terrâ, aliūq; Sol & Luna*, (as *Baronius*) that within our globe of earth, there was another world, another Sunne and Moone, and so he might seeme to exclude this from the number of the other creatures.

But now there is no such danger in this opinion, which is here delivered, since this world is said to be in the Moone, whose creation is particularly exprest.

So that in the first sense I yeeld, that there is but one world, which is all that the arguments do prove, but understand it in the second sense, and so I affirme there may be more nor doe any of the above named objections prove the cōtrary.

Neither can this opinion derogate from the divine Wisdome (as *Aquinas* thinkes) but rather advance

vance it, shewing a *compendium* of providence, that could make the same body a world, and a Moone; a world for habitation, and a Moone for the use of others, and the ornament of the whole frame of Nature. For as the members of the body serve not onely for the preservation of themselves, but for the use and conveniency of the whole; as the hand protects the head as well as saves it selfe, so is it in the parts of the Universe, where each one may serve as well for the conservation of that which is within it, as the helpe of others without it.

*Cusanus de
doct. ignor.
l. 2. c. 12.*

I have now in some measure, shewed that a plurality of worlds does not contradict any principle of reason or place of Scripture, and so cleared the first part of that supposition which is applied in the opinion.

It may next be enquired, whether 'tis possible there may be a globe of elements in that which
we

we call the æthereall parts of the Universe; for if this (as it is according to the common opinion) be priviledged from any change or corruption, it will be in vaine then to imagine any element there, and if we will have another world, we must then seek out some other place for its situation. The third Proposition therefore shall be this.

Proposition 3.

That the heavens doe not consist of any such pure matter which can privilege them from the like change and corruption, as these inferiour bodies are liable unto.

IT hath beene often questioned amongst the ancient Fathers and Philosophers, what kind of matter that should be, of which the heavens are framed, whether or no of any fifth substance distinct from the foure elements, as *Aristotle*

Aristotle holds, and with him some of the late Schoolemen, whose subtile braines could not be content to attribute to those vast glorious bodies, but common materialls, and therefore they themselves had rather take paines to preferre them to some extraordinary nature, whereas notwithstanding, all the arguments they could invent, were not able to convince a necessity of any such matter, as is confest by their owne * side. It were much to be desired, that these men had not in other cases, as well as this, multiplied things without necessity, and as if there had not been enough to be knowne in the secrets of nature, have spun out new subiects from their owne braines to finde more worke for future ages, I shall not mention their arguments, since 'tis already confest, that they are none of them of any necessary consequence, and besides, you may see them set downe in any of the bookes *de Cælo*.

*De Cælo. l. i.
cap. 2.*

* *Colleg.
Cæsimb.
de Cælo. l. i.
c. 2. q. 6.
art. 3.*

But

*In Hexam.
lib. 4.*

*In opere 6.
dierum.
disput. 5.*

*In lib. de
Mundi con-
stit.*

But is it the generall consent of the Fathers, and the opinion of *Lombard*, that the heavens consist of the same matter with these sub-lunary bodies. *St. Ambrose* is confident of it, that hee esteemes the contrary a heresie. True indeed, they differ much among themselves, some thinking them to be made of fire, others of water, but herein they generally agree, that they are all framed of some element or other. For a better confirmation of this, you may see *Ludovicus Molina*, *Euseb. Niremburgius*, with divers others. The venerable *Bede* thought the Planets to consist of all the foure elements, and 'tis likely that the other parts are of an aereous substance, as will be shewed afterward; however, I cannot now stand to recite the arguments for either, I have onely urged these Authorities to counterwaile *Aristotle*, and the Schoolemen, and the better to make way for a proof of their corruptibility.

The

The next thing then to be enquired after, is, whether they be of a corruptible nature, not whether they can be destroyed by God, for this Scripture puts out of doubt.

2 Pet. 3. 12.

Nor whether or no in a long time they would weare away and grow worse, for from any such teare they have been lately privileged. But whether they are capable of such changes and vicissitudes, as this inferiour world is liable unto.

By Doctor
Hackwell
Apol.

The two chiefe opinions concerning this, have both erred in some extremity, the one side going so farre from the other, that they have both gone beyond the right, whilst *Aristotle* hath opposed the truth, as well as the Stoicks.

Some of the Ancients have thought, that the heavenly bodies have stood in need of nourishment from the elements, by which they were continually fed, and so had
divers

Plutarch. de
plac. philos.
l. 2. c. 17.
Nat. Hist.
l. 2. c. 9

Nat. Quæst.
lib. 2. cap. 3.

101. Apost.

divers alterations by reason of their food, this is fathered on *Heracitus*, followed by that great Naturalist *Pliny*, and in generall attributed to all the Stoicks. You may see *Seneca* expressely to this purpose in these words, *Ex illa alimentis omnibus animalibus, omnibus satis, omnibus stellis dividuntur, hinc profertur quo sustineantur tot Sydera tam exercitata, tam avida, per diem, noctemq., ut in opere, ita in pastu.* Speaking of the earth, he saies, from thence it is, that nourishment is divided to all the living creatures, the Plants and the Starres, hence were sustained so many constellations, so laborious, so greedy both day and night, as well in their feeding as working. Thus also *Lucan* sings, *Necnon Oceano pasci Phœbumq., polumq., credimus.*

Unto these *Ptolome* also that learned Egyptian seemed to agree, when he affirms that the body of the Moone is moister, and cooler than any of the other Planets, by reason

reason of the earthly vapours that are exhaled unto it. You see these ancients thought the Heavens to be so farre from this imagined incorruptibility, that rather like the weakest bodies they stood in need of some continuall nourishment without which they could not subsist.

But *Aristotle* and his followers were so farre from this, that they thought those glorious bodies could not containe within them any such principles, as might make them lyable to the least change or corruption, and their chiefe reason was, because we could not in so long a space discern any alteration amongst them; but unto this I answer.

1. Supposing we could not, yet would it not hence follow that there were none, as hee himselve in effect doth confesse in another place; for speaking concerning our knowledge of the Heavens, hee sayes 'tis very imperfect and
E difficult,

*De cælo. l. 1.
cap. 3.*

*De Cælo. l. 2.
cap. 3.*

difficult, by reason of the vasse distance of those bodies from us, and because the changes which may happen unto it, are not either bigge enough or frequent enough to fall within the apprehension and observation of our senses; no wonder then if hee himselfe bee deceived in his assertions concerning these particulars.

2. Though we could not by our senses see such alterations, yet our reason might perhaps sufficiently convince us of them. Nor can we well conceive how the Sunne should reflect against the Moone, and yet not produce some alteration of heate. *Diogenes* the Philosopher was hence perswaded that those scorching heates had burnt the Moone into the forme of a Pumice-stone.

3. I answer that there have been some alterations observed there; witnesse those comets which have beene seene above the Moone.

So that though *Aristotles* consequence were sufficient, when hee proved that the heavens were not corruptible, because there have not any changes being observed in it, yet this by the same reason must bee as prevalent, that the Heavens are corruptible, because there have beene so many alterations observed there; but of these together with a farther confirmation of this proposition, I shall have occasion to speake afterwards; In the meane space, I will referre the Reader to that worke of *Scheiner* a late Jesuit which he titles his *Rosa Vrsina*, where hee may see this point concerning the corruptibility of the Heavens largely handled and sufficiently confirmed.

lib. 4. p. 2.
cy. 24, 35.

There are some other things, on which I might here take an occasion to enlarge my selfe, but because they are directly handled by many others, and doe not immediately belong to the chiefe

matter in hand, I shall therefore referre the Reader to their authors, and omit any large prooffe of them my selfe, as desiring all possible brevity.

1. The first is this: That there are no solid Orbes. If there be a habitable World in the Moore (which I now affirme) it must follow, that her Orbe is not solid, as *Aristotle* supposed; and if not her, why any of the other? I rather thinke that they are all of a fluid (perhaps aereous) substance. *Saint Ambrose*, and *Saint Basil* did endeavour to prove this out of that place in *Isay*, where they are compared to smoake, as they are both quoted by *Rhodiginus*, *Eusebius*, *Nicrembergius* doth likewise from that place confute the solidity and incorruptibility of the Heavens, and cites for the same interpretation the authority of *Eustachius* of *Antioch*; and *Saint Austin*, I am sure seemes to assent unto this opinion, though he does often

Isa. 51. 6.

Ant. lect. 1. 1
6. 4.

Hist. nat.
l. 2. c. 11. 13.

In lib. sup.
Gen. ad lit.

in his other workes contradict it. The testimony of other Fathers to this purpose you may see in *Sixtus Senensis. l. 5. Biblioth. annot. 14.* but for your better satisfaction herein, I shall referre you to the above named *Scheiner* in his *Rosa Ursina*, in whom you may see both authorities and reason, and very largely and distinctly set downe for this opinion, for the better confirmation of which hee adjoynes also some authentick Epistles of *Fredericus Casius Lynceus* a Noble Prince written to *Bellarmino*, containing divers reasons to the same purpose, you may also see the same truth set downe by *Johannes Pena* in his preface to *Euclids Opticks*, and *Christoph. Rothmannus*, both who thought the Firmament to be onely aire: and though the noble *Tycho* doe dispute against them, yet he himselfe holds, *Quod propius ad veritatis penetralia accedit hac opinio, quam Aristotelica vulgariter ap-*

lib. 4. p. 11, 2
c. 7. 26, 30.

De Bella. 15
72. l. 1. c. 9.

*prohata, quæ cælum pluvibus realibus
atque impervius orbibus citra rem re-
plevit.* " That this opinion comes
" neerer to the truth than that com-
" mon one of *Aristotle* which hath
" to no purpose filled the heavens
" with such reall and impervious
" Orbes.

2. There is no element of fire
which must be held with this o-
pinion here delivered; for if we
suppose a world in the Moone, then
it will follow, that the spheare of
fire, either is not there where 'tis
usually placed in the concavity of
his Orbe, or else that there is no
such thing at all, which is more
probable, since there are not any
such solid Orbs, that by their swif-
t motion might heare and enkindle
the adjoyning aire, which is ima-
gined to be the reason of that ele-
ment. Concerning this see *Cardan*
Iohannes Pena that learned French
man, the noble *Tycho*, with divers
others who have purposely hand-
led this proposition.

3. I might adde a third, viz. that there is no Musicke of the spheares, for if they be not solid, how can their motion cause any such sound as is conceived? I doe the rather medle with this, because *Plutarch* speaks as if a man might very conveniently heare that harmony, if he were an inhabitant in the Moone. But I guesse that hee said this out of incogitancy, and did not well consider those necessary consequences which depended upon his opinion. However the world would have no great losse in being deprived of this Musicke, unlesse at some times we had the priviledge to heare it : Then indeede *Philo* the Jew thinks it would save us the charges of diet, and we might live at an easie rate by feeding at the care onely, and receiving no other nourishment ; and for this very reason (saies he) was *Moses* enabled to carry forty daies and forty nights in the Mount without eating any

E 4 thing

De somniis.

*prohata, quæ cælum pluribus realibus
atque impervisiis orbibus citra rem re-
plevit.* “That this opinion comes
“neerer to the truth than that com-
“mon one of *Aristotle* which hath
“to no purpose filled the heavens
“with such reall and impervious
“Orbes.

2. There is no element of fire,
which must be held with this o-
pinion here delivered; for if wee
suppose a world in the Moone, then
it will follow, that the spheare of
fire, either is not there where 'tis
usually placed in the concavity of
his Orbe, or else that there is no
such thing at all, which is most
probable, since there are not any
such solid Orbs, that by their swift
motion might heare and enkindle
the adjoyning aire, which is ima-
gined to be the reason of that ele-
ment. Concerning this see *Cardan*,
Iohannes Pena that learned *French-*
man, the noble *Tycho*, with divers
others who have purposely hand-
led this proposition.

3. I might adde a third, viz. that there is no Musicke of the spheares, for if they be not solid, how can their motion cause any such sound as is conceived? I doe the rather medle with this, because *Plutarch* speaks as if a man might very conveniently heare that harmony, if he were an inhabitant in the Moone. But I guesse that hee said this out of incogitancy, and did not well consider those necessary consequences which depended upon his opinion. However the world would have no great losse in being deprived of this Musicke, unlesse at some times we had the priviledge to heare it : Then indeede *Philo* the Jew thinkes it would save us the charges of diet, and we might live at an easie rate by feeding at the eare onely, and receiving no other nourishment ; and for this very reason (saies he) was *Moses* enabled to tarry forty daies and forty nights in the Mount without eating any thing

De somniis.

thing, because he there heard the melody of the Heavens, - *Resum teneatis*. I know this Musicke hath had great patrons both sacred and prophane authours, such as *Ambrose, Bede, Boetius, Anselme, Plato, Cicero* and others, but because it is not now, I thinke affirmed by any, I shall not therefore bestow either paines or time in arguing against it.

It may suffice that I have onely named these three last, and for the two more necessary, have referred the Reader to others for satisfaction. I shall in the next place proceede to the nature of the Moones body, to know whether that be capable of any such conditions, as may make it possible to be inhabited, and what those qualities are wherein it more neerely agrees with our earth.

Proposition 4.

That the Moone is a solid, compacted, opacous body.

I Shall not need to stand long in the prooffe of this proposition, since it is a truth already agreed on by the generall consent of the most and the best Philosophers.

1. It is solid in opposition to fluid, as is the ayre, for how otherwise could it beate backe the light which it receives from the Sunne?

But here it may be questioned, whether or no the Moone bestow her light upon us by the reflection of the Sunne-beames from the superficies of her body, or else by her owne illumination. Some there are who affirme this latter part. So *Averroes, Cælius Rhodiginus, Iulius Cesar, &c.* and their reason

*De cælo. l. 2.
com. 49. Ant.
lection.*

l. 20. c. 4.

*De phenom.
luna. c. 11.*

reason is because this light is discerned in many places, whereas those bodies which give light by reflexion can there onely be perceived where the angle of reflexion is equall to the angle of incidence, and this is onely in one place, as in a looking-glasse those beames which are reflected from it cannot bee perceived in every place where you may see the glasse, but onely there where your eye is placed on the same line whereon the beames are reflected.

But to this I answer, that the argument will not hold of such bodies, whose superficies is full of unequall parts and gibbosities as the Moone is. Wherefore it is as well the more probable as the more common opinion, that her light proceeds from both these causes, from reflexion and illumination; nor doth it herein differ from our earth, since that also hath some light by illumination: for
how

how otherwise would the parts about us in a Sunne-shine day appeare so bright, when as all the rayes of reflexion cannot enter into oure eye?

2. It is compact, and not a spungie and porous substance. But this is denied by *Diogenes*, *Viteſſio*, and *Reinoldus*, and some others, who held the Moone to bee of the same kind of nature as a Pumice-stone, and this, say they, is the reason why in the Suns eclipses there appeares within her a duskyish ruddy colour, because the Sunne-beames being refracted in passing through the pores of her body, must necessarily be represented under such a colour.

But I reply, if this be the cause of her rednesse, then why doth she not appeare under the same forme when she is about a sextile aspect, and the darkned part of her body is discernable? for then also doe the same rayes passe through her, and therefore in all likelihood should

Plut. de pla.
phil. l. 2. c. 13
O. t. l. 4.
Com. Pur-
bac. Theo. p.
164.

Scaliger exercit. 80.

§ 13.

should produce the same effect, and notwithstanding those beames are then diverted from us, that they cannot enter into our eyes by a streight line, yet must the colour still remaine visible in her body, and besides according to this opinion, the spots would not alwaies be the same, but divers, as the various distance of the Sunne requires. Againe, if the Sunne-beames did passe through her, why then hath she not a taile as the Comets? why doth she appeare in such an exact round? and not rather attended with a long flame, since it is meere-ly this penetration of the Sunne beames that is usually attributed to be the cause of beards in blazing starres.

*Plut. de sa-
luna.*

3. It is opacous, not transparent or diaphanous like Chrystall or glasse, as *Empedocles* thought, who held the Moone to bee a globe of pure congealed aire, like haile inclosed in a spheare of fire, for then.

I. Why

1. Why does shee not alwaies appeare in the full ? since the light is dispersed through all her body ?

2. How can the interposition of her body so darken the Sun, or cause such great eclipses as have turned day into night, that have discovered the stars, and frightened the birds with such a sudden darknesse, that they fell downe upon the earth, as it is related in divers Histories? And therefore *Herodotus* telling of an Eclipse which fell in *Xerxes* time, describes it thus :
 ὁ ἥλιος ἐκλιπὼν τὴν ὥρην τῆς ἡμέρας ἔδραμε ἀφανὴς ὢν. The Sunne leaving his wonted seate in the heavens, vanished away : all which argues such a great darknesse, as could not have beene, if her body had beene perspicuous. Yet some there are who interpret all these relations to bee hyperbolicall expressions, and the noble *Tycho* thinkes it naturally impossible, that any eclipse should cause such darknesse, because

Thucid.
Livii.
Plur. de fa.
Luna.

Herodot. l. 7
c 37.

cause the body of the Moone can never totally cover the Sunne; however, in this he is singular, all other Astronomers (if I may believe *Keplar*) being on the contrary opinion, by reason the Diameter of the Moone does for the most part appeare bigger to us then the Diameter of the Sunne.

De phenom.
LUNA. C. II.

But here *Julius Caesar* once more, puts in to hinder our passage. The Moone (saith he) is not altogether opacous, because 'tis still of the same nature with the Heavens, which are incapable of totall opacity: and his reason is, because perspicuity is an inseparable accident of those purer bodies, and this hee thinkes must necessarily bee granted, for hee stops there, and proves no further; but to this I shall deferre an answer, till hee hath made up his argument.

We may frequently see, that her body does so eclipse the Sunne, as our earth doth the Moone; since then

then the like interposition of them both, doth produce the like effect, they must necessarily be of the like natures, that is a like opacous, which is the thing to be shewed; and this was the reason (as the Interpreters guesse) why *Aristotle* affirmed the Moone to be of the earths nature, because of their agreement in opacity, whereas all the other elements save that, are in some measure perspicuous.

But the greatest difference which may seeme to make our earth altogether unlike the Moone, is, because the one is a bright body, and hath light of its owne, and the other a grosse darke body which cannot shine at all. 'Tis requisite therefore, that in the next place I cleare this doubt, and shew that the Moone hath no more light of her owne than our earth.

*In lib. de
animalib.*

Prop. 5.

Proposition 5.

*That the Moone hath not any light
of her owne.*

*Tostatus in
1. Gen.
Hieron. de
s. Hide.
Hebraeoma
l. 2. c. 4.*

TWas the fancy of some of the Jewes, and more especially of *Rabbi Simeon*, that the Moone was nothing else but a contracted Sunne, and that both those planets at their first creation were equall both in light and quantity, for because God did then call them both great lights, therefore they inferred, that they must be both equall in bignesse. But a while after (as the tradition goes) the ambitious Moone put up her complaint to God against the Sunne, shewing, that it was not fit there should be two such great lights in the heavens, a Monarchy would best become the place of order and harmony. Upon this God commanded her to contract her selfe into a narrower compasse, but she being
much

much discontented hereat, replies,
What ! because I have spoken that
which is reason and equity, must I
therefore be diminished ? This
sentence could not chuse but much
trouble her ; and for this reason
was shee in much distresse and
griefe for a long space, but that her
sorrow might be some way paci-
fied, God bid her be of good
cheere, because her priviledges
and charer should be greater then
the Sens, he should appeare in the
day time onely, shee both in the
day and night, but her melancholy
being not satished with this, shee
replied againe, that that alas was
no benefit, for in the day-time she
should be either not seene, or not
noted. Wherefore, God to com-
fort her up, promised, that his
people the Israelites should cele-
brate all their feasts and holy daies
by a computation of her moneths,
but this being not able to con-
tent her, shee has looked very
melancholy ever since ; howe-

ver shee hath still reserved much light of her owne.

Lib.9. Ar.
chiteſtura
in enar. at.
Pſalmorum.

Others there were, that did thinke the Moone to be a round globe, the one halfe of whose body was of a bright substance, the other halfe being darke, and the divers conversions of those sides towards our eyes, caused the variety of her appearances: of this opinion was *Berosus*, as he is cited by *Vuruvius*, and *S^c. Austin* thought it was probable enough, but this fancy is almost equally absurd with the former, and both of them sound rather like fables, then philosophicall truths. You may commonly see how this latter does contradict frequent and easie experience, for 'tis observed, that that spot which is perceived about her middle, when she is in the increase, may be discern'd in the same place when she is in the ful: whence it must follow, that the same part which was before darkned, is after inlightened, and that the one part

is

is not alwaies darke, and the other light of it selfe, but enough of this, I would be loth to make an enemy, that I may afterwards overcome him, or bestow time in proving that which is already granted. I suppose now, that neither of them hath any patrons, and therefore need no confutation.

'Tis agreed upon by all sides, that this Planet receives most of her light from the Sunne, but the chiefe controversie is, whether or no she hath any of her owne? The greater multitude affirme this. Cardan amongst the rest, is very confident of it, and he thinkes that if any of us were in the Moone at the time of her greatest eclipse, *Lunam aspiceremus non secus ac in numeris cereis splendidissimis accensis, atq; in eas oculis defixis cecutiremus*; "wee should perceive so great a brightnesse of her owne, that would blind us with the meere sight, and when shee is enlighbened by the Sunne,

De Subtil.
lib. 3.

then no eagles eye if there were any there, is able to looke upon her. This *Cardan* saies, and hee doth but say it without bringing any prooffe for its confirmation. However, I will set downe the arguments that are usually urged for this opinion, and they are taken either from Scripture or reason; from Scripture is urged that place, 1 *Cor.* 15. where it is said, *There is one glory of the Sunne, and another glory of the Moone.* *Vlysses Albergettus* urges, that in *Math.* 24. 22. ἡ σελὼν ἔδωσει τὸ φέγγος αὐτῆς, *The Moone shall not give her light*: therefore (saies he) she hath some of her owne.

But to these wee may easily answer that the glory and light there spoken of, may be said to be hers, though it be derived, as you may see in many other instances.

The arguments from reason are taken either

1. From that light which is dif-

discerned in her, when there is a totall eclipse of her owne body, or of the Sunne.

2. For the light which is discerned in the darker part of her body, when she is but a little distant from the Sunne.

1. For when there are any totall eclipses, there appears in her body a great rednesse, and many times light enough to cause a remarkable shade, as common experience doth sufficiently manifest: but this cannot come from the Sunne, since at such times either the earth, or her owne body shades her from the Sun-beames, therefore it must proceede from her owne light.

2. Two or three daies after the new Moone, wee may perceive light in her whole body, whereas the rayes of the Sun reflect but upon a small part of that which is visible, therefore 'tis likely that there is some light of her owne.

In answering to these objecti-

ons, I shall first shew, that this light cannot be her owne, and then declare that which is the true reason of it.

That it is not her own, appears

I. From the variety of it at divers times; for 'tis commonly observed, that sometimes 'tis of a brighter, sometimes of a darker appearance, now redder, and at another time of a more dusky colour. The observation of this variety in divers eclipses, you may see set downe by *Keplar* and many others, but now this could not be if that light were her owne, that being constantly the same, and without any reason of such an alteration: So that thus I may argue.

If there were any light proper to the Moone, then would that Planet appear brightest when she is eclipsed in her Perige, being nearest to the earth, and so consequently more obscure and dusky when she is in her Apoge or farthest.

Opt. Astron.
c. 7. num. 3.

theft from it; the reason is, because the neerer any enlightened body comes to the fight, by so much the more strong are the species and the better perceived. This sequell is granted by some of our adversaries, and they are the very words of noble Tycho, *Si luna genitro gauderet lumine, utiq; cum in umbra terre esset, illud non amitteret, sed eò evidentius exereret, omne enim lumen in tenebris, plus splendet cum alio majore fulgere non prepeditur.* If the Moone had any light of her owne, then would she not lose it in the earths shadow, but rather shine more clearly, since every light appears greater in the darke, when it is not hindered by a more perspicuous brightnesse.

But now the event falls out cleane contrary, (as observation doth manifest, and our opposites themselves doe grant) the Moone appearing with a more reddish and cleare light when she is eclipsed

*De novis
stellis lib. 1.
c. 10.*

Reinhold
comment.
in P. 10.
Theor. pag.
164.

sed being in her Apoge or farthest distance, and a more blackish yron colour when she is in her Perige or neereſt to us, therefore ſhee hath not any light of her owne. Nor may we thinke that the earths ſhadow can cloud the proper light of the Moone from appearing, or take away any thing from her inherent brightneſſe, for this were to thinke a ſhadow to be a body, an opinion altogether miſ-becoming a Philoſopher, as Tycho grants in the fore-cited place, *Nec umbra terre corporeum quid eſt, aut denſa aliqua ſubſtantia, aut lune lumen obtenebrare poſſit, atq; id viſui noſtro præripere, ſed eſt quedam privatio luminis ſolaris, ob interpoſitum opacum corpus terre.* Nor is the earths ſhadow any corporall thing, or thicke ſubſtance, that it can cloud the Moones brightneſſe, or take it away from our ſight, but it is a meere privation of the Suns light, by reaſon of the interpoſition of the earths opacous body.

2. If shee had any light of her owne then that would in it selfe be, either such a ruddy brightnesse as appears in the eclipses, or else such a leaden duskish light as wee see in the darker parts of her body, when shee is a little past the conjunction. (That it must be one of these may follow from the opposite arguments) but it is neither of these, therefore she hath none of her owne.

1. 'Tis not such a ruddy light as appears in eclipses, for then why can wee not see the like rednesse, when wee may discern the obscurer parts of the Moone?

You will say, perhaps, that then the neerenesse of that greater light, takes away that appearance.

I reply, this cannot be, for then why does Mars shine with his wonted rednesse, when he is neere the Moone? or why cannot her greater brightnesse make him appear white as the other Planets?

nor

nor can there be any reason given why that greater light should represent her body under a false colour.

2. 'Tis not such a duskyish leaden light, as we see in the darker part of her body, when shee is about a sextile Asp & distant from the Sunne, for then why does shee appeare red in the eclipses, since the more shade cannot choose such variety, for 'tis the nature of darknesse by its opposition, rather to make things appeare of a more white and cleare brightnesse then they are in themselves, or if it be the shade, yet those parts of the Moone are then in the shade of her body, and therefore in reason should have the like rednesse. Since then neither of these lights are hers, it followes that she hath none of her owne. Nor is this a singular opinion, but it hath had many learned patrons, such was *Macrobius*, who being for this quoted of *Rhodiginus*, he calls him

Semm. Scip.
l. 1. c. 20.

virreconditissima scientiæ, a man who knew more than ordinary Philosophers, thus commending the opinion in the credit of the Authour. To him assents the Venerable *Bede*, upon whom the glosse hath this comparison. As the Looking-glasse represents not any image within it selfe, unlesse it receive some from without; so the Moone hath not any light, but what is bestowed by the Sun. To these agreed *Albertus Magnus*, *Scaliger*, *Mæstin*, and more especially *Mulapertius*, whose words are more pat to the purpose then others, and therefore I shall set them downe as you may finde them in his Preface to his Treatise concerning the *Austriaca sydera*; *Luna*, *Venus*, & *Mercurius*, *terrestres* & *humida sunt substantiæ*, *ide q̃ de suo non lucere, sicut nec terra*. The Moone, *Venus*, and *Mercurie* (saith he) are of an earthly and moist substance, and therefore have no more light of their

Lecl. antiq.
l. 1. c. 15.

In lib. de
natur. rerum

De 4^{te} Coe-
vis. Q. 4^a.
Art. 21.
Exercit 62.
1. Epitome.
Astron.
lib. 4. p. 2.

Originum

l. 3. c. 62.

De Caelo. l. 2.

De ratione

tempor. c. 4.

their owne, then the earth hath. Nay, some there are who thinke that all the other Starres doe receive that light, whereby they appeare visible to us from the Sunne, so *Ptolomie*, *Isidore Hispanensis*, *Albertus Magnus*, and *Bede*, much more then must the Moone shine with a borrowed light.

But enough of this. I have now sufficiently shewed what at the first I promised, that this light is not proper to the Moone. It remaines in the next place, that I tell you the true reason of it. And here, I thinke 'tis probable that the light which appeares in the Moone at the eclipses is nothing else but the second species of the Sunnes rayes which passe through the shadow unto her body: and from a mixture of this second light with the shadow, arises that rednesse which at such times appeares unto us. I may call it *Lumen crepusculum*, the *Aurora* of the

the Moone, or such a kinde of blushing light, that the Sunne causes when he is neere his rising, when he bestowes some small light upon the thicker vapours. Thus wee see commonly the Sunne being in the Horizon, and the reflexion growing weake, how his beames make the waters appeare very red.

The Moabites in Iehorams time when they rose early in the morning, and beheld the waters a farre off, mistooke them for blood. *Et causa hujus est, quia radius solaris in aëre contrahit quandam rubedinem, propter vapores combustos manentes circa superficiem terre, per quos radii transeunt, & ideo cum percussantur in aqua ad oculos nostros, trahunt secum eundem ruborem, & faciunt apparere locum aquarum, in quo est percussio esse rubrum, saith Tostatus.* The reason is, because of his rayes, which being in the lower vapours, those doe convey an imperfect mixed light

2 King. 3.
21.

21. Quest. in
hoc cap.

light upon the waters. Thus the Moone being in the earths shadow, and the Sunne beames which are round about it, not being able to come directly unto her body, yet some second raies there are, which passing through the shadow, make her appeare in that ruddy colour: So that she must appeare brightest, when shee is eclipsed, being in her Apoge, or greatest distance from us, because then the cone of the earths shadow is lesse, and the refraction is made through a narrower medium. So on the contrary, she must be represented under a more darke and obscure forme when she is eclipsed, being in her Perige, or neereest to the earth, because then she is involved in a greater shadow, or bigger part of the cone, and so the refraction passing through a greater medium, the light must needes be weaker which doth proceed from it. If you aske now what the reason may be of that light which we
discerne

discerne in the darker part of the new Moone: I answer, 'tis reflected from our earth which returns as great a brightnesse to that Planet, as it receives from it. This I shall have occasion to prove afterward.

I have now done with these propositions which were set downe to cleare the passage, and confirme the suppositions implied in the opinion, I shall in the next place proceed to a more direct treating of the chiefe matter in hand.

Proposition 6.

That there is a world in the Moone, hath beene the direct opinion of many ancient, with some moderne Mathematicians, and may probably be deduced from the tenents of others.

Since this opinion may be suspected of singularity, I shall there-

*Plat. de plac.
phil. l. 2. c. 13*

Ibid. c. 25.

*Diog. Laert.
l. 2. c. 1. 9.*

*De Caelo. l. 2.
cap. 13.*

therefore first confirme it by sufficient authority of divers authours, both ancient and moderne, that so I may the better cleare it from the prejudice either of an upstart fancy, or an absolute errour. This is by some attributed to *Orphens*, one of the most ancient Greeke Poets, who speaking of the Moone, saies thus, ἡ πολλὰ ὄρεα ἔχει, πολλὰ ἄστυα, πολλὰ μέλαθρα, That it hath many mountaines and cities, and houses in it. To him assented *Xenophanes*, *Anaxagoras*, *Democritus*, and *Heraclitus*, all who thought it to have firme solid ground, like to our earth, containing in it many large fields, champion grounds, and divers inhabitants, unto these agreed *Pythagoras*, who thought that our earth was but one of the Planets which moved round about the Sunne, (as *Aristotle* relates it of him) and the *Pythagoreans* in generall did affirme, that the Moone also was terrestriall, that she was inhabited

as this lower world. That those living creatures & plants which are in her, exceed any of the like kind with us in the same proportion, as their daies are longer than ours: viz. by 15. times. This *Pythagoras* was esteemed by all, of a most divine wit, as appears especially by his valuation amongst the *Romans* who being commanded by the Oracle to erect a statue to the wisest *Grecian*, the Senate determined *Pythagoras* to be meant, preferring him in their judgements before the divine *Socrates*, whom their Gods pronounced the wisest. Some think him a *Jew* by birth, but most agree that hee was much conversant amongst the learned souldiers, & Priests of that Nation, by whom he was informed of many secrets, and perhaps, his opinion, which he vented afterwards in *Greece*, where he was much opposed by *Aristotle* in some worded disputations, but never confuted by any solid reason.

To this opinion of *Pythagoras*

G

cid

Plut. ibid.
cap. 30.

Plin. Nat.
Hist. l. 34.
cap. 6.

Plat. de
conviviis.
Macrob.
Somm. Scip.
lib. I. ca. 11.

did *Plato* also assent, when hee considered that there was the like eclipse made by the earth, and this, that it had no light of its owne, that it was so full of spots. And therefore wee may often reade in him and his followers, of an *ætherea terra*, and *lunares populi*, an æthereall earth, and inhabitants in the Moone; but afterwards this was mixed with many ridiculous fancies: for some of them considering the mysteries implied in the number 3. concluded that there must necessarily bee a Trinity of worlds, whereof the first is this of ours, the second in the Moone whose element of water is represented by the spheare of *Mercury*, the aire by *Venus*, and the fire by the Sunne. And that the whole Universe might the better end in earth as it began, they have contrived it, that *Mars* shall be a spheare of the fire, *Jupiter* of aire, *Saturne* of water; and above all these, the Elysian fields, spacious and

and pleasant places appointed for the habitation of those unspotted soules, that either never were imprisoned in, or else now have freed themselves from any commerce with the body. *Scaliger* speaking of this *Platonick* fancy, *quæ in tres orientes mundum quasi assensum divisit*, thinks 'tis contutation enough, to say, 'tis *Plato's*. However for the first part of this assertion, it was assented unto by many others, and by reason of the grossness and inequality of this planet, 'twas frequently called *quasi terra cœlestis*, as being esteemed the sediment and more imperfect part of those purer bodies, you may see this proved by *Plutarch*, in that delightful work which he properly made for the confirmation of this particular. With him agreed *Alexions* and *Plotinus*, later Writers. Unto these I might also adde the imperfect testimony of *Mohomet*, whose authority of grant can adde but little credit to this opinion,

Exercit. 62.

*De facie
Lune.*

*Instit. ad
discip. Plat.
Cœl. Rhodig.
l. 1. c. 4.*

Azora. 57.
& 65.

Cusa. de
doct. ign. l. 2.
cap. 12.

because hee was an ignorant impostor, but yet consider that originali, from whence hee derived most of his knowledge, and then, perhaps, his witnesse may carry with it some probablity. He is commonly thought by birth to be an Ismaelite, being instructed by the Jewes in the secrets of their Philosophy, and perhaps, learned this from those Rabbies, for in his *Alcaron*, hee talks much of mountaines, pleasant fields, and cleare rivers in the heavens, but because he was for the maine very unlearned, he was not able to deliver any thing so distinctly as he was informed. The Cardinali *Cusanus* and *Iornandus Bunnus*, held a particular world in every Starre, and therefore one of them defining our earth, he saies, it is *stella quadam nobilis, quæ lunam & calorem & influentiam habet aliam, & diversam ab omnibus aliis stellis*; a
 “noble starre having a distinct
 “light, heat and influence from all
 “the

the rest. Unto this *Nichol. Hill*, a country man of ours was inclined, when he said *Astrea terra natura probabilis est*: "That 'tis probable the earth hath a starry nature.

But the opinion which I have here delivered was more directly proved by *Mæstin Kepler*, and *Galileus*, each of them late writers, and famous men for their singular skill in Astronomy. As for those workes of *Mæstin* and *Keplar* wherein they doe more expressly treat of this opinion, I have not yet had the happinesse to see them. However their opinions appeare plaine enough from their owne writings, and the testimony of others concerning them. But *Julius Cæsar*, whom I have above quoted, speaking of their testimony whom I now cite for this opinion, viz. *Keplar* and *Galileus* affirms that to his knowledge they did but jest in those things which they write concerning this, and as for any such world, he assu-

Philos. epicur. part.
434.

*In Theſibus
diſſertatio
cum Nic.
Hil. Nunci-
us Sydereus.*

*De phenom.
lune. c. 4.*

redly knowes they never so much as dreamt of it. But I had rather believe their owne words, then his pretended knowledge.

'Tis true indeed, in many things they doe but trifle, but for the maine scope of those discourses, 'tis as manifest they seriously meant it, as any indifferent Reader may easily discern; otherwise sure *Campanella* (a man as well acquainted with his opinion, and perhaps his person as *Cæsar* was) would never have writ an apologie for him. And besides 'tis very likely if it had beene but a jest, *Galæus* would never have suffered so much for it as afterwards he did. But as for the knowledge which hee pretends, you may guesse what it was by his confidence (I say not presumption) in other assertions, and his boldnesse in them may well derogate from his credit in this. For speaking of *Ptolome's Hypothesis* he pronounces this verdict, *Impossibile est ex-*

Cap. 7.

cen-

centricorum & epicyclorum positio,
nec aliquis est ex Mathematicis
adeo stultus qui veram illam existi-
met. “ The position of *Excen-*
“ tricks and Epicycles is altogether
 “ impossible, nor is there any
 “ Mathematician such a foole as
 “ to thinke it true. I should guesse
 hee could not have knowledge
 enough to maintaine any other
 Hypothesis who was so ignorant
 in Mathematicks, as to deny that
 any good Authour held this. For I
 would faine know whether there
 were never any that thought the
 Heavens to be solid bodies, and
 that there were such kindes of
 motion as is by those feined Orbes
 supplied; if so, then *Cæsar la Galla*
 was much mistaken. I thinke his
 assertions are equally true, that
Galileus and *Keplar* did not hold
 this, and that there were none
 which ever held that other.

But in my following discourse
 I shall most insit on the observa-
 tion of *Galileus*, the inventour of

that famous perspective, whereby we may discern the heavens hard by us, whereby those things which others have formerly guesst at are manifested to the eye, and plainly discovered beyond exception or doubt, of which admirable invention, these latter ages of the world may justly boast, and for this expect to be celebrated by posterity. 'Tis related of *Eudoxus*, that hee wished himself buried with *Phaeton*, so he might stand over the Sunne to contemplate its nature; had hee lived in these daies, he might have enjoyed his wish at an easie rate, and scaling the heavens by this glasse, might plainly have discerned what hee so much desired. *Keplar* considering those strange discoveries which this perspective had made, could not choose but cry out in a *exclamatio* and rapture of admiration. *O multisecum & quovis sceptro pretiosius perspicillum! an qui te dextra tenet, ille non dominus*

con-

constituatur opus Dei? And Johannes Fabricius an elegant writer, speaking of the same glasse, and for this invention preferring our age before those former times of greater ignorance, saies thus; *Adeo sumus superiores veteribus, ut quam illi carminis magici pronuntiatu de missim representasse putantur nos non tantum innocenter demittamus, sed etiam familiari quodam intuitu ejus quasi conditionem intueamur.* “ So much are wee “ above the ancients, that whereas “ they were faine by their magical “ charms to represent the Moones “ approach, wee cannot onely “ bring her lower with a greater “ innocence, but may also with “ a more familiar view behold “ her condition. And because you shall have no occasion to question the truth of those experiments, which I shal afterwards urge from it; I will therefore set downe the testimony of an enemy, and such a witness hath alwaies beene accounted

*De macula
in sole obser.*

might be done by this glasse, in the sight of such things as were neerer at hand, the same Authour will tell you, when hee sayes, that by it those things which could scarce at all bee discerned by the eye at the distance of a mile and a halfe, might plainely and distinctly bee perceived for 16 Italian miles, and that as they were really in themselves, without any transposition or falsifying at all. So that what the ancient Poets were faine to put in a fable, our more happy age hath found out in a truth, and we may discern as farre with these eyes which *Galileus* hath bestowed upon us, as *Lyncus* could with those which the Poets attributed unto him. But if you yet doubt whether all these observations were true, the same Authour may confirme you, when hee saies they were shewed, *Non uni aut alteri, sed quæ plurimis, neq; gregariis hominibus, sed præcipuis atq; disciplinis omnibus,*
nec

ibid. c. 5.

Cap. 1.

*necnon Mathematicis & opticis
præceptis, optimè instructis sedulâ
ac diligenti inspectione.* "Not to
"one or two, but to very many,
"and those not ordinary men, but
"to those who were well vers'd
"in Mathematickes and Opticks,
"and that not with a meere glance
"but with a sedulous and dili-
"gent inspection. And least any
scruple might remaine unanswer-
red, or you might thinke the men
who beheld all this though they
might be skilfull, yet they came
with credulous minds, and so
were more easie to be deluded. He
addes that it was shewed, *vix qui
ad experimenta hæc contradicendi
animo accesserant.* "To such as
"were come with a great deale of
"prej'dice, and an intent of con-
"tradiction. Thus you may see
the certaintie of those experi-
ments which were taken by this
glasse. I have spoken the more
concerning it, because I shall bor-
row many things in my farther
discourse,

discourse, from those discoveries which were made by it.

I have now cited such Authors both ancient and moderne, who have directly maintained the same opinion. I told you likewise in the proposition that it might probably be deduced from the tenent of others: such were *Aristarchus*, *Philolans* and *Copernicus*, with many other later writers who assented to their hypothesis, so *Isach. Reliclus*, *David Origanns*, *Lansbergius*, *Gail. Gilbert*, and (if I may believe *Campanella*) *Innumeralii Angli & Galli*. Very many others both English and French, all who affirmed our Earth to be one of the Planets, and the Sunne to bee the Centre of all, about which the heavenly bodies did move, and how horrid soever this may seeme at the first, yet is it likely enough to be true, nor is there any maxime or observation in Opticks (saith *Pena*) that can disprove it.

Apologia pro Galileo.

Now

Now if our earth were one of the Planets (as it is according to them) then why may not another of the Planets be an earth?

Thus have I shewed you the truth of this proposition: Before I proccede farther, 'tis requisite that I informe the Reader, what method I shall follow in the proving of this chiefe assertion, that there is a World in the Moone.

The order by which I shall bee guided will be that which *Aristotle* uses in his booke *De mundo* (if that booke were his.)

First, *περὶ τῆς ἐν αὐτῇ* of those chiefe parts which are in it; not the elementary and æthereall (as he doth there) since this doth not belong to the elementary controverſie, but of the Sea and Land, &c. Secondly, *περὶ αὐτῆς παθῶν*, of those things which are extrinſecall to it, as the seasons, meteors and inhabitants.

à 10. cap. ad
10m.

Proposition 7.

That those spots and brighter parts which by our sight may be distinguished in the Moone, doe shew the difference betwixt the Sea and Land in that other World.

FOr the cleare prooffe of this proposition, I shall first reckon up and refute the opinions of others concerning the matter and forme of those spots, and then shew the greater probability of this present assertion, and how agreeable it is to that truth, which is most commonly received; as for the opinions of other concerning these, they have beene very many, I will only reckon up those which are common and remarkable.

Some there are that thinke those spots doe not arise from any deformity

So Bede in
à. de Mund.
confit.

formity of the parts, but a deceit of the eye, which cannot at such a distance discerne an equall light in that planet, but these do but onely say it, and shew not any reason for the prooffe of their opinion: Others think that there some bodies betwixt the Sunne and Moone, which keeping off the lights in some parts, doe by their shadow produce these spots which wee there discerne.

Others would have them to be the figure of the mountaines here below represented there as in a looking-glasse. But none of those fancies can bee true, because the spots are still the same, & not varied according to the difference of places, and besides, *Cardan* thinks it is impossible that any image should be conveyed so farre as there to be represented unto us at such a distance, but tis commonly related of *Pythagoras*, that he by writing, what he pleased in a glasse, by the reflexiō of the same species, would make

De subtil.
lib. 3.

make those letters to appeare in the circle of the Moone, where they should be legible by any other, who might at that time be some miles distant from him. * *Agrippa* affirms this to be possible, and the way of performing it not unknowne to himselfe, with some others in his time. It may be that our Bishop did by the like means performe those strange conclusions which hee professes in his *Nuncius inanimatus*, where hee pretends that hee can informe his friends of what he pleases, though they be an hundred miles distant, *fortectiam, vel milliare millesimum*, they are his owne words, and, perhaps, a thousand, and all this in a minutes space, or little more, quicker than the Sonne can move.

Now, what conveyance there should be for so speedy a passage, I cannot conceive, unless it be carried with the light, then which wee know not any thing quicker; but of this onely by the way;

H how.

* *Occulta. ad
Philos. l. 1.
cap. 6.*

however, whether those images can be represented so or not, yet certaine it is, those spots are not such representations. Some thinke that when God had at first created too much earth to make a perfect globe, not knowing well where to bestow the rest, he placed it in the Moone, which ever since hath so darkened it in some parts, but the impiety of this is sufficient confutation, since it so much detracts from the divine power and wisdom.

* *Plut. de placit. phil.*
l. 2. c. 25.

Iosephus l. 2.
con. App.
August. de civit. Dei.
l. 18. c. 41.

The * Stoicks held that planet to be mixed of fire and aire, and in their opinion, the variety of its composition, caused her spots: *Anaxagoras* thought all the starres to be of an earthly nature, mixed with some fire, and as for the Sunne, hee affirmed it to be nothing else but a fiery stone; for which later opinion, the *Athenians* sentenc'd him to death; those zealous Idolaters counting it a great blasphemy, to make their God

God a stone, whereas notwithstanding, they were so senseless in their adoration of Idolls, as to make a stone their God, this *Anaxagoras* affirmed the Moone to be more terrestrialall then the other, but of a greater purity then any thing here below, and the spots hee thought were nothing else, but some cloudy parts, intermingled with the light which belonged to that Planet, but I have above destroyed the supposition on which this fancy is grounded: *Pliny* thinkes they arise from some dristie stuffe, mixed with that moisture which the Moone attracts unto her selfe, but hee was of their opinion, who thought the starres were nourished by some earthly vapours, which you may commonly see refuted in the *Commentaries* on the bookes, *de Cælo*.

Vulvio and *Reinoldus* affirm the spots to be the thicker parts of the Moone, into which the Sunne cannot infuse much light,

Nat. Hist.
lib. 2. c. 9.

Opt. lib. 9.
Comment.
lib. 2. c. 64.

Ex qua parte luna est transpica non solum secundum superficiem, sed etiam secundum substantiam, eatenus clara, ex qua autem parte opaca est, eatenus obscuratur.
De Phenom. cap. II.

and this (say they) is the reason, why in the Sunnes eclipses, the spots and brighter parts are still in some measure distinguished, because the Sunne beames are not able so well to penetrate through those thicker, as they may through the thinner parts of the Planet. Of this opinion also was *Cesar la Galla*, whose words are these, “The Moone doth there appeare clearest, where shee is transpicaous, not onely through the superficies, but the substance also, and there shee seems spotted, where her body is most opacous. The ground of this his assertion was, because hee thought the Moone did receive and bestow her light by illumination onely, and not at all by reflexion, but this, together with the supposed penetration of the Sunne beames, and the perspicuity of the Moones body I have above answered and refuted.

The more common and general opinion is, that the spots are the thinner parts of the Moone, which are lesse able to reflect the beames that they receive from the Sunne, and this is most agreeable to reason, for if the starres are therefore brightest, because they are thicker and more solid then their orbes, then it will follow, that those parts of the Moone which have lesse light, have also lesse thickenesse. It was the providence of nature (say some) that so contrived that planet to have these spots within it, for since that is neerest to those lower bodies which are so full of deformity, 'tis requisite that it should in some measure agree with them, and as in this interior world the higher bodies are the most compleat, so also in the heavens perfection is ascended unto by degrees, and the Moone being the lowest, must be the least pure, and therefore *Philo* the Jew interpre-

*Albert. mag.
de coëvis.
Q. 4. Art.
21.
Colleg. Con.*

De Somniis.

ting *Jacobs* dreame concerning the ladder, doth in an all-gory shew, how that in the fabricke of the world, all things grow perfecter as they grow higher, and this is the reason (saith hee) why the Moone doth not consist of any pure simple matter, but is mixed with aire, which shewes so darkely within her body.

But this cannot be a sufficient reason, for though it were true that nature did frame every thing perfecter as it was higher, yet is it as true, that nature frames every thing fully perfect for that office to which shee intends it. Now, had she intended the Moone merely to reflect the Sunne beames and give light, the spots then had not so much argued her providence, as her unskilfulnesse and imperfection, as if in the haste of her worke shee could not tell how to make that body exactly fit, for that office to which she appointed it.

It is likely then that she had some other

*S alig ex-
crit. 62.*

other end which moved her to produce this variety, and this in all probability was her intent to make it a fit body for habitation with the same conveniencies of sea and land, as this inferiour world doth partake of. For since the Moone is such a vast, such a solid and opacous body like our earth (as was above proved) why may it not be probable, that those thinner and thicker parts appearing in her, doe shew the difference betwixt the sea and land in that other world; and *Galileus* doubts not, but that if our earth were visible at the same distance, there would be the like appearance of it.

As for the forme of those spots, some of the vulgar think they represent a man, and the Poets guess 'tis the boy *Endimion*, whose company shee loves so well, that shee carries him with her, others will have it onely to be the face of a man as the Moone is usually pictured, but *Albertus* thinks rather,

* Eusebius
Nioremb.
Hist. Nat.
lib. 8. c. 15.

that it represents a Lyon with his taile towards the East, and his head the West, and * some others have thought it to be very much like a Fox, & certainly 'tis as much like a Lyon as that in the *Zodiacke*, or as *Vrja major* is like a Beare.

I should guesse that it represents one of these as well as another, and any thing else as well as any of these, since 'tis but a strong imagination, which fancies such images as schoole-boyes usually doe in the markes of a wall, whereas there is not any such similitude in the spots themselves, which rather like our Sea, in respect of the land, appeares under a rugged and confused figure, and doth not represent any distinct image, so that both in respect of the matter and the forme it may be probable enough, that those spots and brighter parts may shew the distinction betwixt the Sea and Land in that other world.

Proposition 8.

*The spots represent the Sea, and
the brighter parts the Land.*

VHen I first compared the nature of our earth and water with those appearances in the Moone; I concluded contrary to the proposition, that the brighter parts represented the water, and the spots the land; of this opinion likewise was *Keplar* at the first, but my second thoughts, and the reading of others, have now convinced me (as after he was) of the truth of that Proposition which I have now set downe. But before I come to the confirmation of it, I shall mention those scruples which at first made mee doubt of the truth of this opinion.

1. It may be objected, 'tis probable, if there be any such sea and land as ours that it bears some proportion and similitude with ours: but now this Proposition takes away

*Opt. Astro.
c 6. num. 9.
Dissert. cum
Nuncio Gal.*

Exercit. 38.

way all likenesse betwixt them, for whereas the superficies of our earth is but the third part of the whole surface in the globe, two parts being overspread with the water (as *Scaliger* observes) yet here according to this opinion, the Sea should be lesse then the Land, since there is not so much of the bespotted, as ther is of the enlightened parts, wherefore 'tis probable, that either there is no such thing at all, or else that the brighter parts are the Sea.

2. The water, by reason of the smoothnesse of its superficies, seemes better able to reflect the Sun beames then the earth, which in most places is so full of ruggednesse of grasse and trees, and such like impediments of reflection, and besides, comon experience shewes, that the water shines with a greater and more glorious brightnesse then the earth, therefore it should seeme that the spots are the earth, and the brighter parts the water.

But

But to the first it may be answered.

1. There is no great probability in this consequence, that because 'tis so with us, therefore it must be so with the parts of the Moone, for since there is such a difference betwixt them in divers other respects, they may not, perhaps, agree in this.

2. That assertion of *Scaliger* is not by all granted for a truth. *Fromondus* with others, thinke, that the superficies of the Sea and Land in so much of the world as is already discovered, is equall, and of the same extension.

3. The Orbe of thicke and vaporous aire which encompasses the Moone, makes the brighter parts of that Planet appeare bigger then in themselves they are; as I shall shew afterwards.

To the second it may be answered, that though the water be of a smooth superficies, and so may seeme most fit to reverberate the light,

De Meteoris
l 5. c. 1.
Art. 1.

light, yet because 'tis of a perspicuous nature, therefore the beames must sinke into it, and cannot so strongly and clearely be reflected. *Sicut in speculo ubi plumbum abrasum fuerit*, (saith Cardin) as in Looking-glasses where part of the lead is raized off, and nothing left behind to reverberate the image, the species must there passe through and not backe againe; so it is where the beames penetrate and sinke into the substance of the body, there cannot be such an immediate and strong reflection as when they are beate backe from the superficies, and therefore the Sunne causes a greater heate by farre upon the Land then upon the water. Now as for that experiment, where 'tis said, that the waters have a greater brightnesse then the Land: I answer, 'tis true onely there where they represent the image of the Sunne or some bright cloud, and not in other places, as is very
plaine

plaine by common observation.

So that notwithstanding those doubts, yet this Proposition may remaine true, that the spots may be the Sea, and the brighter parts the Land. Of this opinion was *Plutarch*: unto him assented *Keplar* and *Galilaeus*, whose words are these, *Si quis veterum Pythagoraeorum sententiam excusitare velit, lunam scilicet esse quasi telurem alteram, ejus pars lucidior terrenam superficiem, obscurior verò aquam magis congruè representet. Mibi autem dubium fuit nunquam terrestris globi à longè conspecti, aëre & radiis solaribus persusi, terream superficiem clariorē, obscuriorem verò aquam sese in conspectum daturam.* “If any man have a minde to renew the opinion of the *Pythagoreans*, that the *Moone* is another earth, then her brighter parts may fitly represent the earths superficies, and the darker part the water: and for my part, I never doubted
“but

*De facie lunae.
Dissertatio.
Nunc. Syd.*

“but that our earthly globe being
 “shined upon by the Sunne, and
 “beheld at a great distance, the
 “Land would appeare brightest
 “and the Sea more obscurely. The
 reasons may be.

1. That which I urged about
 the foregoing Chapter, because
 the water is the thinner part, and
 therefore must give the lesse light.

2. Because observation tels us,
 that the spotted parts are alwaies
 smooth and equall, having every
 where an equality of light, when
 once they are enlightened by the
 Sunne, whereas the brighter parts
 are full of rugged gibbosities and
 mountaines having many shades in
 them, as I shall shew more at large
 afterwards.

That in this Planet there must
 be Seas, *Campanella* indeavours to
 prove out of Scripture interpre-
 ting the *waters above the Firmament*
 spoken of in *Genesis* to be
 meant of the Sea in this world.
 For (saith he) 'tis not likely that
 there

*Apologia pro
 Galileo.*

there are any such waters above the Orbes to moderate that heate which they receive from their swift motion (as some of the Fathers thinke) nor did *Moses* meane the Angells which may be called spirituall waters, as *Origen* and *Austin* would have it, for both these are rejected by the generall consent : nor could he meane any waters in the second region, as most Commentators interpret it. For first there is nothing but vapours, which though they are afterwards turned into water, yet while they remaine there, they are onely the matter of that element, which may as well be fire or earth, or aire. 2. Those vapors are not above the *expansum*, but in it. So that hee thinkes there is no other way to salve all, but by making the Planets severall worlds with Sea & Land, with such Rivers and Springs, as wee have here below : Especially since *Esdra* speakes of the springs above the Fir-

Confession.
l. 13. c. 32.

2 Esdr. 4. 7.

Firmament, but I cannot agree with him in this, nor doe I thinke that any such thing can be proved out of Scripture.

Before I proceede to the next Position, I shall first answer some doubts which might be made against the generality of this truth, whereby it may seeme impossible that there should be either Sea or Land in the Moone; for since she moves so swiftly as Astronomers observe, why then does there nothing fall from her, or why doth shee not shake something out by the celerity of her revolution? I answer, you must know that the inclination of every heavie body, to its proper Center doth sufficiently tie it unto its place, so that suppose any thing were separated, yet must it necessarily returne againe, and there is no more danger of their falling into our world then there is feare of our falling into the Moone.

But yet there are many fabulous relations

relations of such things as have dropped thence. There is a tale of the Nemean Lyon that *Hercules* slew, which first rushing among the heards out of his unknown den in the Mountaine of *Cytheron* in *Bæotia*, the credulous people thought he was sent from their Goddesse the Moone. And if a whirle-winde did chance to snatch any thing up, and afterwards raine it downe againe, the ignorant multitude are apt to believe that it dropt from Heaven. Thus *Metecenus* relates the story of a Calf which fell downe in a storme, the beholders thinking it a Moon-calf, and that it fell thence. So *Cardan* travelling upon the Apennine Mountaines, a sudden blast tooke off his hat, which if it had bene carryed farre, he thinks the peasants who had perceived it to fall, would have sworne it had rained hats. After some such manner many of our prodigies come to passe; and the people are wil-

I

ling,

ling to believe anything, which they may relate to others as a very strange and wonderfull event. I doubt not but the Trojan *Palladium*, the Romane *Minerva*, and our Ladies Church at *Loretto*, with many sacred reliques preserved by the Papists might droppe from the Moone as well as any of these.

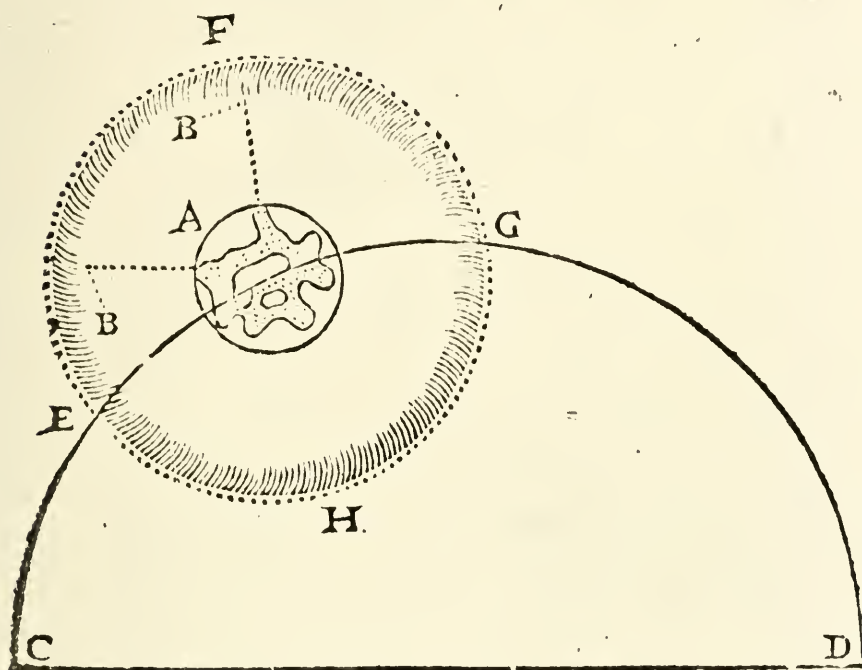
But it may be againe objected, suppose there were a bullet shot up in that world, would not the Moone runne away from it, before it could fall downe, since the motion of her body (being every day round our earth) is farre swifter than the other, and so the bullet must be left behinde, and at length fall downe to us? To this I answer,

1. If a bullet could be shot so farre till it came to the circumference of those things which belong to our center, then it would fall downe to us.

2. Though there were some heavy

heavie body a great height in that
ayer, yet would the motion of its
centre by an attractive vertue still
hold it w^hin its convenient di-
stance, so that whether their earth
moved or stood still, yet would
the same violence cast a body from
it equally farre. That I may the
plainer expresse my meaning, I
will set downe this Diagramme.

I a Suppose



Suppose this earth were A, which was to move in the circle C, D. and let the bullet be supposed at B. within its proper verge; I say, whether this earth did stand still or move swiftly towards D, yet the bullet would still keepe at the same distance by reason of that Magneticke vertue of the center (if I may so speake) whereby all things within its spheare are attracted

tracted with it. So that the violence to the bullet, being nothing else but that whereby 'tis removed from its center, therefore an equall violence can carry a body from its proper place, but at an equall distance whether or no the center stand still or move.

The impartiall Reader may finde sufficient satisfaction for this and such other arguments as may be urged against the motion of that earth in the writings of *Capernicus* and his followers, unto whom for brevities sake I will referre them.

Proposition 9.

That there are high Mountaines, deepe vallies, and spacious plaines in the body of the Moone.

THough there are some who thinke Mountaines to bee a deformity in the earth, as if they

Nat. hist.
l. 36. c. 1.

Psal. 104.
v. 18.

were either beate up by the flood, or else cast up like so many heaps of rubbish left at the creation, yet if well considered, they will be found as much to conduce to the beauty and conveniency of the universe as any of the other parts. Nature (saith *Pliny*) purposely framed them for many excellent uses: partly to tame the violence of greater Rivers, to strengthen certaine joynts within the veines and bowels of the earth, to breake the force of the Seas inundation, and for the safety of the earths inhabitants, whether beasts or men. That they make much for the protection of beasts the Psalmist testifies, *The highest hills are a refuge for the wilde Goats, and the rocks for Conies.* The Kingly Prophet had learned the safety of these by his owne experience, when he also was faine to make a mountaine his refuge from the fury of his Master *Saul*, who persecuted him in the wilderness.

True

True indeed, such places as these
keepe their neighbours poore, as
becing most barren, but yet they
preserve them safe, as being most
strong, witnesse our unconquered
Wales and *Scotland*, whose grea-
test protection hath beene the na-
turall strength of their Countrey,
so fortified with Mountaines,
that these have alwaies been unto
them sure retraites from the vio-
lence and oppression of others,
wherefore a good Authour doth
rightly call them natures bul-
warkes cast up at God Almightyes
owne charges, the scornes and
curbs of victorious armies, which
made the Barbarians in *Curtius*
so confident of their owne safety,
when they were once retired to
an inaccessible mountaine, that
when *Alexanders* Legate had
brought them to a parley and per-
swading them to yeeld, told them
of his masters victories, what Seas
and Wildernesles hee had passed,
they replied that all that might

he, but could *Alexander* fly too? Over the Seas he might have ships, and over the land horses, but hee must have wings before he could get up thither. Such safety did those barbarous nations conceive in the mountaines whereunto they were retyred, certainly then such usefull parts were not the effect of mans sinne, or produced by the Worlds curse the flood, but rather at the first created by the goodnesse and providence of the Almighty.

So that if I intend to prove that the Moone is such a habitable world as this is, 'tis requisite that I shew it to have the same conveniencies of habitation as this hath, and here if some Rabbi or Chymicke were to handle the point they would first prove it out of Scripture, from that place in *Moses* his blessing, where hee speakes of the ancient mountaines and lasting hills, *Deut. 33*

Deut. 33.
15.

הָרֵי קָדִים וְהַבְּשֵׁת עֹלָם
for

for having immediately before mentioned those blessings which should happen unto *Ioseph* by the influence of the Moone, he does presently exegetically iterate the in blessing him with the chief things of the ancient Mountains and lasting hills; you may also see the same expression used in *Jacobs* blessing of *Ioseph*.

Gen. 49. 26

But however we may deale pro or con in Philosophy, yet we must not jest with divine truths, or bring Scripture to patronize any fancy of our owne, though, perhaps, it be truth. For the better prooffe of this proposition, I might here cite the testimony of *Diodorus*, who thought the Moone to be full of rugged places, *velut terrestribus tumulis superciliosam*, but he erred much in some circumstances of this opinion, especially where he saies, there is an Island amongst the *Hyperboreans*, wherein those hills may to the eye be plainly discovered, and for this reason

* *Lib. aut*
l. 1. c. 15.
Plat. de plac.
l. 2. c. 25.

De celo, l. 2.
p. 49.

reason. * *Celius* calls him a fabulous Writer, but you may see more expresse authority for the prooffe of this in the opinions of *Anaxagoras* and *Democritus*, who held that this Planet was full of champion grounds, mountains and vallies, and this seemed likewise probable unto *Augustinus Nissus*, whose words are these: *Forſitan non eſt remotum dicere, lunæ partes eſſe diverſas, velati ſunt partes terræ, quarum aliæ ſunt valloſæ, aliæ monioſæ, ex quarum differentia effici poteſt facies il' a lunæ; nec eſt ratiõis diſſonum, nam luna eſt corpus imperfectè Sphericum, cum ſit corpus ab ultimo cœlo elongatum, ut ſupra dixit Ariſtoteles.* Perhaps,
 “it would not be amiſſe to ſay
 “that the parts of the Moone
 “were divers, as the parts of this
 “earth, whereof ſome are vallies,
 “and ſome mountaines, from the
 “difference of which, ſome ſpots
 “in the Moone may proceed, nor
 “is this againſt reaſon, for that
 “Planet

“Planet cannot be perfectly sphericall, since 'tis so remote a body from the first orbe, as *Aristotle* had said before. You may see this truth assented unto by *Blanca-*
mus the Jesuit, and by him confirmed with divers reasons. *Keplar* hath observed in the *Moones* eclipses, that the division of her enlightened part from the shaded, was made by a crooked unequal line, of which there cannot be any probable cause conceived, unless it did arise from the ruggedness of that planet, for it cannot at all be produc'd from the shade of any mountains here upon earth, because these would be solified before they could reach so high in a conicall shadow, that they would not be at all sensible unto us (as might easily be demonstrated) nor can it be conceived what reason of this difference there should be in the *Sunne*. Wherefore there being no other body that hath any thing to doe in eclipses, we must necessarily

De Mundi
f. 6 pars 3.
c. 4.

Astron. Opt.
c. 6. num. 9.

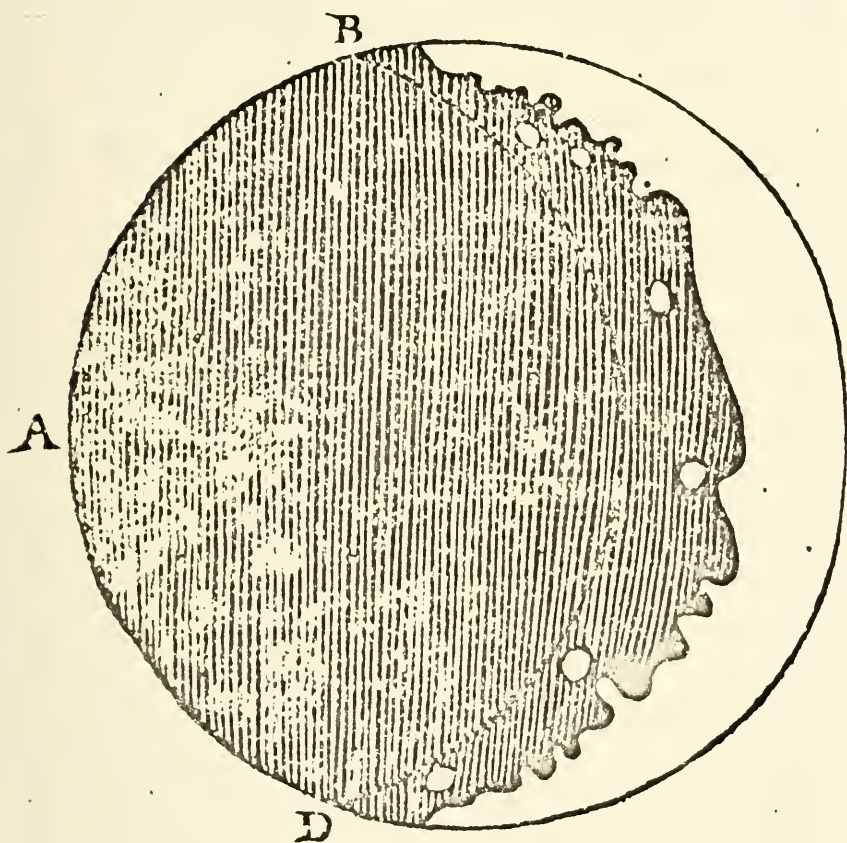
riely conclude, that it is caused by a variety of parts in the Moone it selfe and what can there be but its gibbosities? Now if you should aske a reason why there should be such a similitude of these in that Planet, the same *Keplar* shall jest you out an answer, for supposing (saith he) those inhabitants are bigger than any of us in the same proportion, as their daies are longer than ours, viz. by fifteen times it may bee for want of stones to erect such vast houses as were requisite for their bodies, they are faine to digge great and round hollowes in the earth, where they may both procure water for their thirst, and turning about with the shade, may avoid those great heats which otherwise they would be lyable unto; or if you will give *Cesar la Galla* leave to guesse in the same manner, he would rather think that those thirsty nations cast up so many and so great heaps of earth in digging of their wine cellars

lars, but this onely by the way.

I shall next produce the eye-witnesse of *Galileus*, on which I most of all depend for the prooffe of this Proposition, when he beheld the new Moone through his perspective, it appeared to him under a rugged and spotted figure, seeming to have the darker and enlightned parts divided by a tortuous line, having some parcels of light at a good distance from the other, and this difference is so remarkable, that you may easily perceive it through one of those ordinary perspectives, which are commonly sold amongst us, but for your better apprehending of what I deliver, I will set downe the Figure as I find it in *Galileus*:

*Nuncius
Sydereus.*

Suppose



Suppose A B C D to represent the appearance of the Moones body being in a sextile, you may see some brighter parts separated at a pretty distance from the other, which can bee nothing else but a reflexion of the Sunne-beames upon some parts that are higher then the rest, and those obscure gibbosities

ities which stand out towards the enlightened parts must bee such hollow and deepe places whereto the rayes cannot reach, but when the Moone is got further off from the Sunne, and come to that fullnesse, as this line BD doth represent her under, then doe these parts also receive an equall light, excepting onely that difference which doth appeare betwixt their sea and land. And if you do consider how any rugged body would appeare, being enlightned, you would easily conceive that it must necessarily seeme under some such gibbous unequall forme, as the Moone is here represented. Now for the infallibility of these appearances, I shall referre the reader to that which hath beene said in the 6th Proposition.

But *Cesar la Galla* affirmes, that all these appearances may consist with a plaine superficies, if wee suppose the parts of the body to be some of them, *Diaphanous*, and
some

some opacous ; and it you obj. & that the light which is conveyed to any diaphanous part in a plaine superficies must be by a continued line, whereas here there appears many brighter parts among the obscure at some distance from the rest. To this he answers, it may arise from some secret conveyances and channels within her body, that doe consist of a more diaphanous matter which being covered over with an opacous superficies, the light passing through them may breake out a great way off, whereas the other parts betwixt may still remaine darke. Just as the River *Arctusa* in *Sicile* which runnes under ground for a great way, and afterwards breakes out againe. But because this is one of the chiefest fancies whereby hee thinkes hee hath fully answered the arguments of this opinion, I will therefore set downe his answer in his owne words, lest the Reader might suspect more in them

them then I have exprest. *Non est impossibile cæcos ductus diaphani & perspicui corporis, sed opacâ superficie protendi, usq; in diaphanam aliquam ex profundo in superficiem, emergentem partem, per quos ductus lumen longo postmodum interstitio erumpat, &c.* But I reply, if the superficies betwixt these two enlightened parts remaine darke because of its opacity, then would it alwaies be darke, and the Sunne could not make it partake of light more then it could of perspicuity: But this contradicts all experience as you may see in *Galileus*, who affirmes that when the Sunne comes nearer to his opposition, then that which is betwixt them, both is enlightened as well as either. Nay this opposes his owne-eye-witnesse, for he confesses himselfe that he saw this by the glasse He had said before that he came to see those strange sights discovered by *Galileus* his glasse with an intent of contradiction, and you

may reade that confirmed in the weakenesse of this answere, which rather bewrayes an obstinate then a perswaded will, for otherwise sure hee would never have undertooke to have destroyed such certaine proofes with so groundlesse a fancy.

But it may bee objected, that 'tis almost impossible, and altogether unlikely that in the Moone there should be any mountaines so high as those observations make them, for doe but suppose according to the common principles, that the Moones diameter unto the Earths is very neere to the proportion of 2. to 7, suppose withall that the Earths diameter containes about 7000 Italian miles, and the Moones 2000 (as is commonly granted) now *Galileus* hath observed that some parts have been enlightened when they were the twentieth part of the diameter distant from the common terme of illumination, so that
hence

hence it must necessarily follow that there may bee some Mountaines in the Moone so high, that they are able to cast a shadow a 100 miles off. An opinion that sounds like a prodigie or a fiction; wherefore 'tis likely that either those appearances are caused by somewhat else besides mountaines, or else those are fallible observations, from whence may follow such improbable inconceivable consequences.

But to this I answer:

1. You must consider the height of the Mountaines is but very little, if you compare them to the length of their shadowes. *Sr. Walter Rawleigh* observes that the Mount *Athos* now called *Lacus* casts its shadow 300 furlongs, which is above 37 miles, and yet that Mount is none of the highest, nay *Solinus* (whom I should rather believe in this kinde) affirms that this Mountaine gives his shadow quite over the Sea, from

Hist. l. 1. c. 7.
§ 11.

Polybist. c. 21.

Macedon to the Ile of *Lemnos* which is 700 furlongs or 84 miles, and yet according to the common reckoning it doth scarce reach 4 miles upwards, in its perpendicular height.

2. I affirm that there are very high Mountaines in the Moone. *Keplar* and *Galileus* thinke that they are higher than any which are upon our earth. But I am not of their opinion in this, because I suppose they goe upon a false ground whilst they conceive that the highest mountaine upon the earth is not above a mile perpendicular.

Whereas 'tis the common opinion and found true enough by observation, that *Olympus*, *Atlas*, *Taurus* and *Emus*, with many others are much above this height. *Tenariffa* in the Canary Ilands is proved by computation to be above 8 miles perpendicular, and about this height is the mount *Perjacaca* in *America*. *St. Walter Rawleigh*

Rawleigh seemes to thinke, that the highest of these is neere 30 miles upright: nay *Aristotle* speaking of *Caucasus* in *Asia*, affirms it to bee visible for 560 miles, as some interpreters finde by computation, from which it will follow, that it was 78 miles perpendicularly high, as you may see confirmed by *Jacobus Mazonius*, and out of him in *Blancanus* the Jesuite. But this deviates from the truth more in excessse then the other doth in defect. However though these in the moone are not so high as some amongst us, yet certaine it is they are of a great height, and some of them at the least foure miles perpendicular. This I shall prove from the observation of *Galileus*, whose glasse can shew this truth to the senses, a prooffe beyond exception and certaine that man must needs be of a most timorous faith who dares not believe his owne eye.

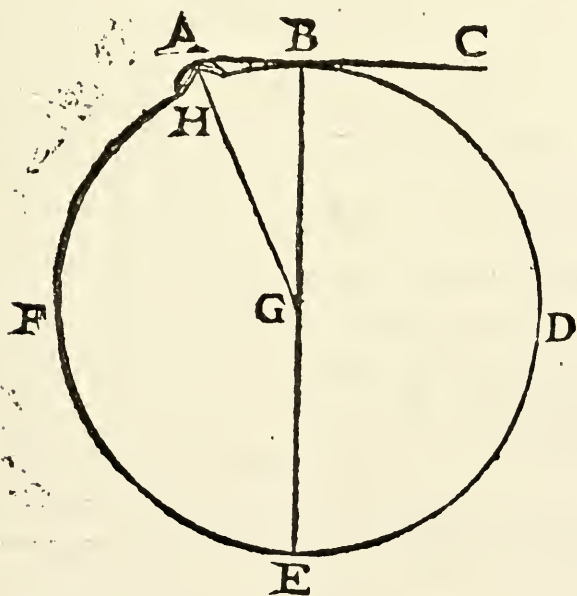
By that perspective you may
K 3 plainly

*Meteor. l. 1.
c. 11.*

*Comparatio
Arist. cum
Platone,
Secl. 3. c. 5.*

*Expos. in
loc. Math.
Arlis. loc.
148.*

plainely discerne some enlightned parts (which are the mountaines) to be distant from the other about the twentieth part of the diameter. From whence it will follow, that those mountaines must necessarily be at the least foure Italian miles in height.



For let B D E F be the body of the moone, A B C will be a ray or beame of the Sunne, which enlightens a mountaine at A and
Bis

B is the point of contingency, the distance betwixt *A* and *B* must bee supposed to be the twentieth part of the diameter which is an 100 miles, for so far are some enlightened parts severed from the common terme of illumination. Now the aggregate of the quadrate from *A B* a hundred, and *B G* a 1000 will bee 1010000, unto which the quadrate arising from *A G* must be equall according to the 47th proposition in the first booke of elements. Therefore the whole line *A G* is somewhat more than 104, and the distance betwixt *H A* must be above 4 miles, which was the thing to be proved.

But it may be againe objected, if there be such rugged parts, and so high mountaines, why then cannot wee discern them at this distance, why doth the moone appeare unto us so exactly round. and not rather as a wheele with teeth?

I answered, by reason of too great a distance, for if the whole body appeare to our eye so little, then those parts which beare so small a proportion to the whole will not at all be sensible.

But it may be replied, if there were any such remarkable hills, why does not the limbe of the moone appeare like a wheele with teeth to those who looke upon it through the great perspective on whose witnesse you so much depend? or what reason is there that she appeares as exactly round through it as she doth to the bare eye? certainly then either there is no such thing as you imagine, or else the glasse failes much in this discovery.

To this I shall answer out of *Galileus*.

1. You must know that there is not meerey one ranke of mountaines about the edge of the moone, but divers orders, one mountaine behind another, and so

so there is somewhat to hinder those void spaces which otherwise, perhaps, might appeare.

Now where there be many hills, the ground seemes even to a man that can see the tops of all. Thus when the sea rages, and many vast waves are lifted up, yet all may appeare plaine enough to one that stands at the shore. So where there are so many hills, the inequality will be lesse remarkable, if it be discerned at a distance.

2. Though there be mountains in that part which appeares unto us, to be the limbe of the Moone, as well as in any other place, yet the bright vapours hide their appearance: for there is an orbe of thicke vaporious aire that doth immediatly compasse the body of the Moone, which though it have not so great opacity, as to terminate the sight, yet being once enlightened by the Sunne, it doth represent the body of the Moone under a greater forme, and hinders
our

our sight from a distinct view of her true circumference. But of this in the next Chapter.

I have now sufficiently proved, that there are hills in the Moone, and hence it may seeme likely that there is also a world, for since providence hath some speciall end in all its workes, certainly then these mountaines were not produced in vaine, and what more probable meaning can wee conceive there should be, than to make that place convenient for habitation.

Proposition 10.

That there is an Atmo-sphera, or an orbe of grosse vaporous aire, immediately encompassing the body of the Moone.

AS that part of our aire which is nearest to the earth, is of a thicker substance than the other, by reason tis alwaies mixed with
some

some vapours, which are continually exhaled into it. So is it equally requisite, that if there be a world in the Moone, that the aire about that should be alike qualified with ours. Now, that there is such an orbe of grosse aire, was first of all (for ought I can reade) observed by *Meslin*, afterward, ascribed unto by *Keplar* and *Galileus*, and since by *Baptista Cissatus*, *Sheiner* with others, all of them confirming it by the same arguments which I shall onely cite, and then leave this Proposition.

I. 'Tis observed, that so much of the Moone as is enlightened, is alwaies part of a bigger circle then that which is darker. Their frequent experience hath proved this, and an easie observation may quickly confirme it. But now this cannot proceede from any other cause so probable, as from this orbe of aire, especially when we consider how that planet shining with a borrowed light, doth not
send

*Vide Euseb.
Nierem.
de Nat. Hist.
l. 2. c. 11.*

send forth any such rayes as may make her appearance bigger then her body.

2. 'Tis observed in the Solary eclipses, that there is a great trepidation about the body of the Moone, from which we may likewise argue an Atmo-sphæra, since we cannot well conceive whatso probable a cause there should be of such an appearance as this, *Quod radii Solares à vaporibus Lunam ambientibus fuerint intercisi*, that the Sun beames were broken and refracted by the vapours that encompassed the Moone.

3. I may adde the like argument taken from another observation which will be easily tried and granted. When the Sunne is eclipsed, wee discern the Moone as shee is in her owne naturall bignesse, but then she appeares somewhat lesse then when shee is in the full, though she be in the same place of her supposed excentrick and epicycle, and therefore *Tycho* hath

Scheiner.
Ros. Vis. L. 4.
pars 2. c. 27.

hath calculated a Table for the Diameter of the divers new Moones. But now there is no reason so probable to salve this appearance, as to place an orbe of thicker aire, neere the body of that Planet, which may be enlightened by the reflected beames, and through which the direct raies may easily penetrate.

But some may object that this will not consist with that which was before delivered, where I said, that the thinnest parts had least light.

If this were true, how comes it to passe then, that this aire should be as bright as any of the other parts, when as tis the thinnest of all?

I answer, if the light be received by reflection, then the thickest body hath most, because it is best able to beate backe the raies, but if the light be received by illumination (especially if there be an opacous body behinde, which

which may double the beames by reflexion) as it is here, then I deny not but a thinne body may re-
taine much light, and perhaps, some of those appearances which wee take for fiery comets, are nothing else but a bright cloud enlightened, so that probable it is, there may be such aire without the Moone, and hence it comes to passe, that the greater spots are onely visible towards her middle parts, and none neere the circumference, not but that there are some as well in those parts as else where, but they are not there perceivable, by reason of those brighter vapours which hide them.

Proposition

Proposition 11.

*That as their world is our Moone,
so our world is their Moone.*

I Have already handled the first thing that I promised according to the Method which *Aristotle* uses in his Booke *de Mundo*, and shew'd you the necessary parts that belong to this world in the Moone. In the next place 'tis requisite that I proceed to those things which are extrinsecall unto it, as the Seasons, the Meteors, and the Inhabitants.

I. Of the Seasons;

And if there be such a world in the Moone, 'tis requisite then that their seasons should be some way correspondent unto ours, that they should have Winter and Summer, night and day, as wee have.

Now that in this Planet there is some similitude of Winter and
Sum-

which may double the beames by reflexion) as it is here, then I deny not but a thinne body may retaine much light, and perhaps, some of those appearances which wee take for fiery comets, are nothing else but a bright cloud enlightened, so that probable it is, there may be such aire without the Moone, and hence it comes to passe, that the greater spots are onely visible towards her middle parts, and none neere the circumference, not but that there are some as well in those parts as else where, but they are not there perceivable, by reason of those brighter vapours which hide them.

Proposition

Proposition II.

*That as their world is our Moone,
so our world is their Moone.*

I Have already handled the first thing that I promised according to the Method which *Aristotle* uses in his Booke *de Mundo*, and shew'd you the necessary parts that belong to this world in the Moone. In the next place 'tis requisite that I proceed to those things which are extrinsecall unto it, as the Seasons, the Meteors, and the Inhabitants.

I. Of the Seasons;

And if there be such a world in the Moone, 'tis requisite then that their seasons should be some way correspondent unto ours, that they should have Winter and Summer, night and day, as wee have.

Now that in this Planet there is some similitude of Winter and
Sum-

De gen. animal. l. 4. 12.

Summer is affirmed by *Aristotle* himselfe, since there is one hemisphere that hath alwaies heate and light, and the other that hath da knesse and cold. True indeed, their daies and yeeres are alwaies of one and the same length, but tis so with us also under the Poles, and therefore that great difference is not sufficient to make it altogether unlike ours, nor can we expect that every thing there should be in the same manner as it is here below, as if nature had no way but one to bring about her purposes. Wee may easily see what great differences there are amongst us, betwixt things of the same kinde. Some men (say they) there are, who can live onely upon linells, without eating any thing, and the same Plant, saith *Besoldus*, hath sometimes contrary effects. *Mandragora* which growes in *Syria*, it flames the lust, whereas *Mandragora* which grows in other places doth coole the blood & quench lust.

*Plat. de fac.
De naturâ
populorum.
6. 3.*

Now

Now if with us there be such great difference betwixt things of the same kinde, we have no reason then to thinke it necessary that both these worlds should be altogether alike, but it may suffice if they bee correspondent in something onely, however it may be questioned whether it doth not seeme to be against the wisdom of providence, to make the night of so great a length, when they have such a long time unfit for worke? I answer no, since tis so, and more with us also under the poles; and besides, the generall length of their night is somewhat abated in the bignesse of their Moone which is our earth. For this returns as great a light unto that Planet, as it receives from it. But for the better prooffe of this, I shall first free the way from such opinions as might otherwise hinder the speede of a clearer progresse.

Plutarch one of the chiefe patrons

Plut. de fac. luna.

trons of this world in the Moone, doth directly contradict this proposition ; affirming, that those who live there may discerne our world as the dregges and sediment of all other creatures, appearing to them through clouds and foggy mists, and that altogether devoid of light, being base and unmoveable, so that they might well imagine the darke place of damnation to be here situate, and that they onely were the inhabitants of the world, as being in the midst betwixt Heaven and Hell.

To this I may answer, 'tis probable that *Plutarch* spake this inconsiderately, and without a reason, which makes him likewise fall into another absurditie, when he sayes our earth would appeare immoveable, whereas questionlesse though it did not, yet would it seeme to move, and theirs to stand still, as the Land doth to a man in a Shippe ; according to that

that of the Poet :

*Provehimur portu, terræq, urbescq,
recedunt.*

And I doubt not but that ingenuous Authour would easily have recanted if hee had beene but acquainted with those experiences which men of latter times have found out, for the confirmation of this truth.

2. Unto him assents *Macrobius*, whose words are these ; *Terra accepto solis lumine clarescit, tantummodo, non relucet.* " The earth " is by the Sunne-beames made " bright, but not able to enlighten " any thing so faire. And his reason is, because this being of a thicke and grosse matter, the light is terminated in its superficies, and cannot penetrate into the substance; whereas the moone doth therefore seeme so bright to us, because it receives the beames within it selfe. But the weaknesse of this assertion, may bee easily manifest by a common experience.

for polished Steele (whose opacity will not give any admittance to the rayes) reflects a stronger heate then glasse, and so consequently a greater light.

3. 'Tis the generall consent of Philosophers, that the reflection of the Sunne-beames from the earth doth not reach much above halfe a mile high, where they terminate the first region, so that to affirme they might ascend to the moone, were to say, there were but one region of aier, which contradicts the proved and received opinion.

Unto this it may be answered :

That it is indeed the common consent, that the reflexion of the Sunne-beames reach onely to the second region, but yet some there are, and those too Philosophers of good note, who thought otherwise. Thus *Plotinus* is cited by *Calius*, *Si concipias te in sublimi quopiam mundi loco, unde oculis subjiciatur terra moles aquis circumfusa*

*Ant. lect. l. 1.
c. 4.*

eumfusa, & solis syderumq; radiis illustrata, non aliam profecto visam iri probabile est, quam qualis modo visatur lunaris globi species. “ If
 “ you did conceive your selfe to
 “ bee in some such high place,
 “ where you might discern the
 “ whole Globe of the earth and
 “ water, when it was enlightened
 “ by the Sunnes rayes, ’tis probable
 “ it would then appeare to you in
 “ the same shape as the moone
 “ doth now unto us. Thus also
Carolus Milapertius, whose
 words are these, *Terra hæc nostra si in luna constituti essemus, splendida prorsus quasi non ignobilis planeta, nobis appareret.* “ If wee
 “ were placed in the moone, and
 “ from thence beheld this our
 “ earth, it would appeare unto us
 “ very bright, like one of the
 “ nobler Planets. Unto these doth
Fromondus assent, when he sayes,
Credo equidem quod si oculus quispiam in orbe lunari foret, globum
terrae & aquæ instar ingentis syderis

Præfat. ad Austriacæ Syd.

Meteor. l. 1. c. 2. Art. 2.

à sole illustrem conspiceret. “ I
 “ believe that this globe of earth
 “ and water would appeare like
 “ some great Starre to any one,
 “ who should looke upon it from
 “ the moone. Now this could not
 be, nor could it shine so remark-
 ably, unlesse the beames of light,
 were reflected from it. And there-
 fore the same *Fromondus* expressly
 holds, that the first region of ayre
 is there terminated, where the
 heate caused by reflexion begins
 to languish, whereas the beames
 themselves doe passe a great way
 further. The chiefe argument
 which doth most plainly mani-
 fest this truth, is taken from a
 common observation which may
 be easily tryed.

If you behold the Moone a
 little before or after the conjun-
 ction, when she is in a sextile with
 the Sunne, you may discern not
 onely the part which is enlight-
 ned, but the rest also to have in it
 a kind of a dusky light, but if you
 chuse

chuse out such a scituation, where
 some house or chimney (being
 some 70 or 80 paces distant from
 you) may hide from your eye the
 enlightned hornes, you may then
 discerne a greater and more re-
 markeable shining in those parts
 unto which the Sunne beames
 cannot reach; nay there is so great
 a light, that by the helpe of a
 good perspective you may dis-
 cernie its spots. In so much that
Blancanus the Jesuite speaking of
 it sayes, *Hæc experientia ita me*
aliquando se fellit, ut in hunc ful-
gorem casu ac repente incidens, ex-
istimarim novo quodam miraculo
tempore adolescentis lune factum esse
plenilunium. “ This experiment
 “ did once so deceive mee, that
 “ happening upon the sight of this
 “ brightnesse upon a sudden, I
 “ thought that by some new mi-
 “ racle the Moone had beene got
 “ into her full a little after her
 “ change.

But now this light is not proper

De mundi
fab. p. 3^a. c. 3.

Progym. 1.

l. 20. c. 5.

to the Moone, it doth not proceed from the rayes of the Sunne which doth penetrate her body, nor is it caused by any other of the Planets and Starrs. Therefore it must necessarily follow, that it comes from the earth. The two first of these I have already proved, and as for the last, it is confidently affirmed by *Celius*, *Quod si in disquisitionem evocet quis, an lunari syderi lucem fœnerent planetae item alii, asseveranter astruendum non fœnerare.* “ If any should aske “ whether the other Planets lend “ any light to the Moone; I answer “ they doe not. True indeed, the noble *Tycho* discussing the reason of this light attributes it to the Planet *Venus*, and I grant that this may convey some light to the Moone, but that it is not the cause of this wherof wee now discourse, is of it selfe sufficiently plaine, because *Venus* is sometimes over the Moone, when as shee cannot convey any light to that part

part which is necessary to the Sun.

It doth not proceede from the fixed starres, for then it would retain the same light in eclipses, whereas the light at such times is more ruddy and dull. Then also the light of the Moone would not be greater or lesser, according to its distance from the edge of the earths shadow, since it did at all times equally participate this light of the starres.

Now because there is no other body in the whole Universe, save the earth, it remaines that this light must necessarily be caused by that which with a just gratitude repaies to the Moone, such illumination as it receives from her.

And as loving friends equally participate of the same joy and griefe, so doe these mutually partake of the same light from the Sunne, and the same darkenesse from the eclipses, being also severally helped by one another in their

their greatest wants : For when the Moone is in conjunction with the Sunne, and her upper part receives all the light, then her lower Hemisphære (which would otherwise be altogether darke) is enlightened by the reflexion of the Sunne beames from the earth. When these two planets are in opposition, then that part of the earth which could not receive any light from the Sunne beames, is most enlightened by the Moone, being then in her full ; and as she doth most illuminate the earth when the Sunne beames cannot, so the gratefull earth returns to her as great, nay greater light when shee most wants it ; so that alwaies that visible part of the Moone which receives nothing from the Sunne, is enlightened by the earth, as is proved by *Galileus*, with many more arguments, in that Treatise which he calls *Systema mundi*. True indeed, when the Moone comes to a quartile, then
you

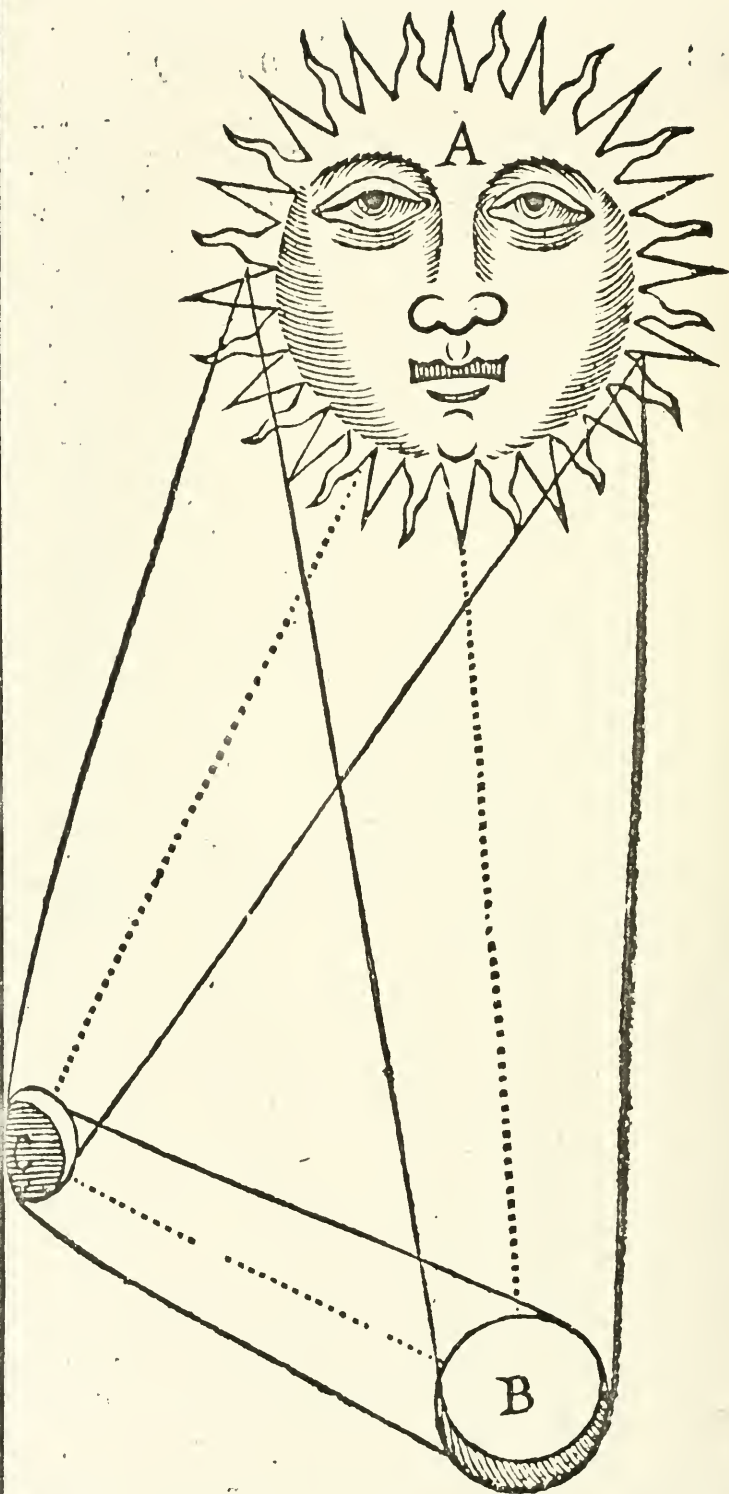
you can neither discern this light, nor yet the darker part of her body, but the reason is, because of the exuperancy of the light in the other parts. *Quippe illustratum medium speciem recipit valentiores*, the clearer brightnesse involves the weaker, it being with the species of sight, as it is with those of sound, and as the greater noisedrownes the lesse, so the brighter object hides that which is more obscure. But they doe alwaies in their mutuall vicitudes participate of one anothers light; so also doe they partake of the same defects and darknings, for when our Moone is eclipsed, then is their Sunne darkened, and when our Sunne is eclipsed, then is their Moone deprived of its light, as you may see affirmed by *Messin. Quod si terram nobis ex alto liceret intueri, quemadmodum deficientem lunam ex longinquo spectare possumus, videremus tempore eclipsis solis terram aliquam*

Scal exerc.
62.

Epit. Astro.
l. 4. part. 2.

aliquam partem lumine solis deficere, eodem plane modo sicut ex opposito luna deficit, “ If wee
“ might behold this globe of earth
“ at the same distance as we doe
“ the Moone in her defects, wee
“ might discern some part of it
“ darkened in the Sunnes eclipses,
“ just so as the Moone is
“ in hers. For as our Moone is eclipsed by the interposition of our earth, so is their Moone eclipsed by the interposition of theirs. The manner of this mutuall illumination betwixt these two you may plainly discern in this Figure following.

Where



Where A represents the Sun, B the Earth, and C the Moone; Now suppose the Moone C to be in a sextile of increase, when there is onely one small part of her body enlightened, then the earth B will have such a part of its visible Hemisphere darkened, as is proportionable to that part of the Moone which is enlightened; and as for so much of the Moone, as the Sun beames cannot reach unto, it receives light from a proportionall part of the earth which shines upon it, as you may plainly perceive by the Figure.

You see then that agreement and similitude which there is betwixt our earth and the Moone. Now the greatest difference which makes them unlike, is this, that the Moone enlightens our earth round about, whereas our earth gives light onely to that Hemisphere of the Moone which is visible unto us, as may be certainly gathered from the constant appearance

appearance of the same spots, which could not thus come to passe, if the Moone had such a diurnall motion about its own axis, as perhaps our earth hath. And though some suppose her to move in an epicycle, yet this doth not so turne her body round, that we may discerne both Hemispheares, for according to that hypothesis, the motion of her eccentricke, doth turne her face towards us, as much as the other doth from us.

But now if any question what they doe for a Moone who live in the upper part of her body? I answer, the solving of this is the most uncertaine and difficult thing that I know of concerning this whole matter. But yet I will give you two probable conjectures.

I. Perhaps, the upper Hemisphere of the Moone doth receive a sufficient light from those planets about it, and amongst these *Venus* (it may be) bestowes a more especiall

ciall brightnesse, since *Galileas* hath plainly discerned that she suffers the same increases and decreases, as the Moone hath, and 'tis probable that this may be perceived there without the help of a glasse, because they are farrre nearer it than wee. When *Venus* (saith *Keplar*) lies downe in the Perige or lower part of her supposed Epicycle, then is she in conjunction with her husband the Sunne, from whom after she hath departed for the space of ten moneths, shee gets *plenum uterum*; and is in the full.

But you'll reply, though *Venus* may bestow some light when she is over the Moone, and in conjunction, yet being in opposition, she is not visible to them, and what shall they then doe for light?

I answer, then they have none: nor doth this make so great a difference betwixt those two Hemispheres as there is with us, betwixt the places under the poles, and

and the line, but if this bee not sufficient, then I say in the second place that

2. Perhaps there may be some other enlighened body above the Moone which we cannot discerne, nor is this altogether improbable because there is almost the like observed in Saturne, who appears through this glasse with two lesser bodies on each side, which may supply the office of Moones, unto each hemisphære thus :



So in this world also there may be some such body, though wee cannot discerne it, because the Moone is alwaies in a streight line, betwixt our eye and that. Nor is it altogether unlikely that there should bee more moones to one Orbe, because *Jupiter* also is observed to have foure such

M bodies

bodies that move round about him.

De doct. ig.
l. 2, c. 12.

But it may seeme a very difficult thing to conceive, how so grosse and darke a body as our earth, should yeeld such a cleare light as proceedes from the Moone, and therefore the Cardinall *de Cusa* (who thinkes every Starre to be a severall world) is of opinion that the light of the Sunne is not able to make them appeare so bright, but the reason of their shining is, because wee behold them at a great distance through their regions of fire which doe set a shining lustre upon those bodies that of themselves are darke. *Vnde si quis esset extra regionem ignis, terra ista in circumferentia sue regionis per medium ignis lucida stella appareret.* " So that if a " man were beyond the region of " fire, this earth would appeare " through that as a bright Starre. But if this were the onely reason then would the Moone bee freed

freed from such increases and decreases as shee is now lyable unto.

Kepiar thinkes that our earth receives that light whereby it shines from the Sunne, but this (saith he) is not such an intended cleare brightnesse as the Moone is capable of, and therefore hee guesſes, that the earth there is of a more chokie soyle like the Ile of *Creete*, and so is better able to reflect a stronger light, whereas our earth must supply this intention with the quantity of its body, but this I conceive to be a needlesse conjecture, since our earth if all things were well considered, will be found able enough to reflect as great a light. For

1. Consider its opacity, if you marke these sublunary things, you shall perceive that amongst them, those that are most perspicuous, are not so well able to reverberate the Sunne beames as the thicker bodles. The rayes passe singly
M 2 through

through a diaphanous matter, but in an opacous substance they are doubled in their returne and multiplied by reflexion. Now if the moone and the other Planets can shine so clearely by beating backe the Sunne beames, why may not the earth also shine as well, which agrees with them in the cause of this brightnesse their opacity?

2. Consider what a cleare light wee may discern reflected from the earth in the middest of Summer, and withall conceive how much greater that must bee which is under the line, where the rayes are more directly and strongly reverberated.

3. Consider the great distance at which wee behold the Planets, for this must needs adde much to their shining and therefore *Cassius* (in the above cited place) thinks that if a man were in the Sunne, that Planet would not appeare so bright to him, as now

it doth to us, because then his eye could discern but little, whereas here wee may comprehend the beames as they are contracted in a narrow body. *Keplar* beholding the earth from a high mountaine when it was enlightned by the Sonne confesses that it appeared unto him of an incredible brightness, whereas then the reflected rayes entered into his sight obliquely; but how much brighter would it have appeared if hee might in a direct line behold the whole globe of earth and these rayes gathered together? So that if wee consider that great light which the earth receives from the Sonne in the Summer, and then suppose wee were in the Moone, where wee might see the whole earth hanging in those vast spaces where there is nothing to terminate the sight, but those beames which are there contracted into a little compass; I say, if wee doe well consider this, wee may easily

conceive, that our earth appears as bright to those other inhabitants in the Moone, as theirs doth to us.

Proposition 12.

That tis probable there may bee such Meteors belonging to that world in the Moone, as there are with us.

Plutarch discussing this point affirmes that it is not necessary there should be the same meanes of growth and fructifying in both these worlds, since nature might in her policy finde out more waies then one how to bring about the same effect. But however he thinks its probable that the *Moone* her selfe sendeth forth warme winds, and by the swiftnesse of her motion there should breathe out a sweet and comfortable ayer, pleasant dewes and gentle moylture, which

which might serve for the refreshing and nourishment of the inhabitants and plants in that other world.

But since they have all things alike with us, as sea and land, and vaporous ayer encompassing both, I should rather therefore thinke that nature there should use the same way of producing meteors as she doth with us (and not by a motion as *Plutarch* supposes) because shee doth not love to vary from her usuall operations without some extraordinary impediment, but still keepes her beaten path unlesse she be driven thence.

One argument whereby I shall manifest this truth, may be taken from those new Starres which have appeared in divers ages of the world, and by their parallax have beene discerned to have been above the *Moone*, such as was that in *Cassiopeia*, that in *Sagittarius*, with many others betwixt the Planets. *Hipparchus* in his time

Plin. nat. hist.
l. 2, c. 16.

looke especiall notice of such as these, and therefore fancied out such constellations in which to place the Starres; shewing how many there were in every asterisme, that so afterwards posterity might know, whether there were any new Starre produced or any old one missing. Now the nature of these Comets may probably manifest, that in this other world there are other meteors also; for these in all likelihood are nothing else but such evaporations caused by the Sunne, from the bodies of the Planets. I shall prove this by shewing the improbabilities and inconveniences of any other opinion.

For the better pursuite of this 'tis in the first place requisite that I deale with our chiefe adversary, *Caspar Li Gilla*, who doth most directly oppose that truth which is here to bee proved. Hee endeavouring to confirme the incorruptibility of the Heavens, and

and being there to satisfie the argument which is taken from these comets, He answers it thus: *Aut argumentum desumptum ex parallaxi non est efficax, aut si est efficax, eorum instrumentorum usum decipere, vel ratione astri vel medii, vel distantie, aut ergo erat in suprema parte aeris, aut si in cælo, tum forsân factum erat ex reflectione radiorum Saturni & Jovis, qui tunc in conjunctione fuerant.* “ Either

“ the argument from the parallax
“ is not efficacious, or if it be, yet
“ the use of the instruments might
“ deceive either in regard of the
“ starre or the *medium*, or the di-
“ stance, and so this comet might
“ be in the upper regions of the
“ aire, or if it were in the heavens,
“ there it might be produced by
“ the reflexion of the rayes from
“ *Saturne* and *Jupiter*, who were
“ then in conjunction. You see
what shifts hee is driven to, how
he runnes up and downe to many
starting holes, that hee may find
some

* Epist. 95.

some shelter, and instead of the strength of reason, he answers with a multitude of words, thinking (as the Proverbe is) that hee may use haile, when hee hath no thunder, *Nihil turpius* (saith * Seneca) *dubio est incerto, pedem modo referente, modo producente.* “What
 “can there bee more unseemely
 “in one that should be a faire
 “disputant, then to be now here,
 “now there, and so uncertaine,
 “that one cannot tell where to
 “find him. He thinkes that there
 are not Comets in the heavens,
 because there may be many other
 reasons of such appearances, but
 what he knowes not, perhaps (he
 saies) that argument from the pa-
 rallax is not sufficient, or if it be,
 then there may be some deceit in
 the observation. To this I may
 safely say, that hee may justly be
 accounted a weake Mathematici-
 an who mistrusts the strength of
 this argument, nor can hee know
 much in Astronomy, who under-
 stands

stands not the parallax, which is the foundation of that Science, and I am sure that hee is a timorous man, who dares not believe the frequent experience of his senses, or trust to a demonstration.

True indeed, I grant 'tis possible, that the eye, the *medium*, and the distance may all deceive the beholder, but I would have him shew which of all these was likely to cause an error in this observation? Merely to say they might be deceived is no sufficient answer, for by this I might confute the positions of all Astronomers, and affirme the starres are hard by us, because 'tis possible they may be deceived in their observing that distance. But I forbear any further reply; my opinion is of that Treatise, that either it was set forth purposely to tempt a confutation, that hee might see the opinion of *Galileus* confirmed by others, or else it was invented with as much haste and negligence as it was printed, there be-

being in it almost as many faults as lines.

Others thinke that these are not any new Comets, but some ancient starres that were there before, which now shine with that unusuall brightnesse, by reason of the interposition of such vapors which doe multiply their light, and so the alteration will be here onely, and not in the heavens. Thus *Aristotle* thought the appearance of the milkie way was produced, for he held that there were many little starres, which by their influence did constantly attract such a vapour towards that place of heaven, so that it alwaies appeared white. Now by the same reason may a brighter vapor be the cause of these appearances.

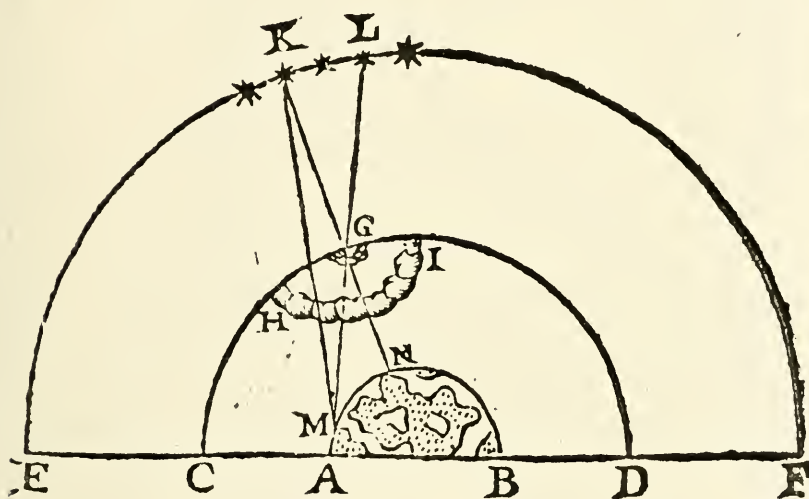
But how probable soever this opinion may seeme, yet if well considered, you shall finde it to be altogether absurd and impossible: for,

1. These starres were never seene

seene there before, and is not likely that a vapour being hard by us can so multiply that light which could not before be at all discerned.

2. This supposed vapour cannot be either contracted into a narrow compasse or dilated into a broad: 1. it could not be within a little space, for then that starre would not appeare with the same multiplied light to those in other climates: 2. it cannot be adilated vapour, for then other starres which were discerned through the same vapour would seeme as biggas that; this argument is the same in effect with that of the paralax, as you may see in this Figure.

Suppose



Suppose A B to be a Hemisphere of one earth, C D to be the upper part of the highest region, in which there might be either a contracted vapour, as G, or else a dilated one, as H I. Suppose E F likewise to represent halfe the heavens, wherein was this appearing Comet at K. Now I say, that a contracted vapour, as G could not cause this appearance, because an inhabitant at M could not discern the same starre with

with this brightnesse, but perhaps another at L, betwixt which the vapour is directly interposed. Nor could it be caused by a dilated vapour, as H 1, because then all the starres that were discerned through it would be perceived with the same brightnesse.

Tis necessary therefore that the cause of this appearance should be in the heavens. And this is granted by the most and best Astronomers. But, say some, this doth not argue any naturall alteration in those purer bodies, since tis probable that the concourse of many little vagabond starres by the union of their beames may cause so great a light. Of this opinion were *Anaxagoras* and *Zeno* amongst the ancient, and *Baptista Cissius*, *Blancanus*, with others amongst our moderne Astronomers. For, say they, when there happens to be a concourse of some few starres, then doe many other flie unto them from all the parts of heaven
like

like so many Bees unto their King. But 1. tis not likely that amongst those which wee count the fixed starres there should be any such uncertaine motions, that they can wander from all parts of the heavens, as if Nature had neglected them, or forgot to appoint them a determinate course. 2. If there be such a conflux of these, as of Bees to their King, then what reason is there that they do not still tarry with it, that so the Comet may not be dissolved? But enough of this. You may commonly see it confuted by many other arguments. Others there are, who affirme these to be some new created stars, produced by an extraordinary supernaturall power. I answer, true indeed, tis possible they might be so, but however tis not likely they were so, since such appearances may be salved some other way, wherefore to fly unto a miracle for such things, were a great injury to nature, and to derogate from

from her skill, an indignitie much mis-becomming a man who professes himselte to be a Philosopher, *Miraculum* (saith one) *est ignorantie Asylum*, a miracle often serves for the receptacle of a lazy ignorance which any industrious Spirit would be ashamed of, it being but an idle way to shift off the labour of any further search. But here's the misery of it, wee first tie our selves unto *Aristotles* Principles, and then conclude, that nothing could contradict them but a miracle, whereas 'twould be much better for the Common-wealth of learning, if we would ground our Principles rather upon the frequent experiences of our owne, then the bare authority of others.

Some there are, who thinke that these Comets are nothing else, but exhalations from our earth, carried up into the higher parts of the Heaven. So *Peno*,
N *Roth-*

Tycho Pro-
gym. l. 1.
cap. 9.

Rotbmannus & Galileus, but this is not possible, since by computation 'tis found that one of them is above 300 times bigger than the whole Globe of Land and Water. Others therefore have thought that they did proceed from the body of the Sun, and that that Planet onely is *Cometarum officina, unde tanquam emissarii & exploratores emitterentur, brevia ad solem redituri*: The shop or forge of Comets from whence they were sent, like so many spies, that they might in some short space returne againe, but this cannot be, since if so much matter had proceeded from him alone, it would have made a sensible diminution in his body. The Noble *Tycho* therefore thinkes that they consist of some such fluider parts of the Heaven, as the milkie way is framed of, which being condensed together, yet not attaining to the consistency of a Starre, is in
some

some space of time rarified againe into its wonted nature. But this is not likely, for if there had beene so great a condensation as to make them shine so bright, and last so long, they would then sensibly have moved downewards towards some center of gravity, because whatsoever is condensd must necessarily grow heavier, whereas these rather seemed to ascend higher, as they lasted longer. But some may object, that a thing may be of the same weight, when it is rarified, as it had while it was condensd: so metalls, when they are melted, and when they are cold: so water also when it is frozen, and when it is fluid, doth not differ in respect of gravity. But to these I answer: First, Metalls are not rarified by melting, but molified. Secondly, waters are not properly condensd, but congealed into a harder substance, the parts being not

contracted closer together, but still possessing the same extension.

And beside, what likely cause can we conceive of this condensation, unlesse there be such qualities there, as there are in our ayre, and then why may not the Planets have the like qualities, as our earth? and if so, then 'tis more probable that they are made by the ordinary way of nature, as they are with us, and consist of exhalations from the bodies of the Planets. Nor is this a singular opinion; but it seemed most likely to *Camillus Gloriosus. Tb. Campanella, Fromondus*, with some others. But if you aske whither all these exhalations shall returne, I answer, every one into his owne Planet: if it be againe objected, that then there will be so many centers of gravity, and each severall Planet will be a distinct world; I reply, perhaps all of them are so

De Comet.

l. 5. c. 4.

Apolog.

Meteor.

l. 3. c. 2.

Art. 6.

Ioban. Fabr.

Carolus

Malapertus

de Helio cyc.

Scheiner.

Rosa Vrina.

so except the Sunne, though *Cusannus* thinkes there is one also, and later times have discovered some lesser Planets moving round about him. But as for *Saturne*, he hath two Moones on each side. *Jupiter* hath foure; that incircle his body with their motion. *Venus* is observed to increase and decrease as the Moone. *Mars*, and all the rest, derive their light from the Sunne onely. Concerning *Mercury*, there hath beene little or no observation, because for the most part, he lies hid under the Sunne beames, and seldome appears by himselfe. So that if you consider their quantity, their opacity, or these other discoveries, you shall finde it probable enough, that each of them may be a severall world. But this would be too much for to vent at the first. the chiefe thing at which I now ayme in this discourse, is to

prove that there may be one in the Moone.

It hath beene before confirmed that there was a spheare of thicke vaporious aire encompassing the Moone, as the first and second regions doe this earth. I have now shewed, that thence such exhalations may proceede as doe produce the Comets: now from hence it may probably follow, that there may be wind also and raine, with such other Meteors as are common amongst us. This consequence is so dependant, that *Fromondus* dares not deny it, though hee would (as hee confesse himselfe) for if the Sunne be able to exhale from them such fumes as may cause Comets, why not then such as may cause winds, and why not such also as cause raine, since I have above shewed, that there is Sea and Land as with us. Now raine seemes to be more especially requisite for them, since

De meteor.

l. 3. c. 2.

Art. 6.

since it may allay the heate and scorchings of the Sunne, when he is over their heads. And nature hath thus provided for those in *Peru*, with the other inhabitants under the line.

But if there be such great, and frequent alterations in the Heavens, why cannot wee discern them?

I answer:

1. There may be such, and we not able to perceive them, because of the weaknesse of our eye, and the distance of those places from us, they are the words of *Ficinus*, as they are quoted by *Fromondus* in the above cited place) *Possunt maxima permutationes in cælo fieri, etiamsi a nobis non conspiciantur, hoc visus nostri debilitas & immensa cæli distantia faciunt.* And unto him assents *Fromondus* himselfe, when a little after hee saies, *Si in sphaeris planetarum degeremus, plurima forsan cœlestium nebularum vellere toto æthere passim*

N 4 dispersa

dispersa videremus, quorum species jam evanescebat nimia spatii intercapedine. “If we did live in the
 “spheres of the Planets, wee
 “might there, perhaps, discern
 “many great clouds dispersed
 “through the whole Heavens,
 which are not now visible by
 reason of this great distance.

Differ. 2.
 cum nunc.
 Galil.

2. *Mæslin* and *Keplar* affirme, that they have seene some of these alterations. The words of *Mæslin* are these (as I finde them cited.) *In eclipsi Lunari vespere Dominicæ Palmarum Anni 1605. in corpore Lune versus Boream, nigricans quedam macula conspicua fuit, obscurior cætero toto corpore, quod candentis ferri figuram representabat; dixisset nubila in malam regionem extensa pluviis & tempestuosis imbribus gravata, cujusmodi ab excelsorum montium jugis in humiliora convallium loca videre non raro contingit.* “In that
 “lunary eclipse which happened in the even of Palme-
 “day,

“ day, in the yeere 1605, there
 “ was a certaine blackish spot
 “ discerned in the Northerly
 “ part of the Moone, being dar-
 “ ker than any other part of her
 “ body, and representing the co-
 “ lour of red hot yron; you might
 “ conjecture that it was some di-
 “ lated cloud, being pregnant
 “ with showers, for thus doe such
 “ lower clouds appeare from the
 “ tops of high mountaines.

Unto this I may adde another
 testimony of *Bapt. Cisar*, as he is
 quoted by *Nicrembergius*, ground-
 ed upon an observation taken
 23. yeeres after this of *Mæstin*,
 and writ to this *Euseb. Nicrem-*
berg. in a letter by that diligent
 and judicious Astronomer. The
 words of it runne thus: *Et qui-*
dem in eclipsi nupra solari qua fuit
ipso die natali Christi, obseruati
clare in luna soli supposita, quidpi-
am quod valde probat id ipsum
quod Cometae quoq; & maculae so-
lares urgent, nempe cœlum non esse

Hist. Nat.
l. 2. c. 11.

à tenui-

*atenuitate & variationibus aeris
exemptum, nam circa Lunam ad-
verti esse sphaeram seu orbem quen-
dam vaporosum, non secus atq³ cir-
cum terram, adeoq³ sicut ex terrain
aliquam usq³ sphaeram vapores &
exhalationes expirant, ita quoq³ ex
luna.* “In that late solary eclipse
“which happened on Christ-
“mas day, when the Moone was
“just under the Sunne, I plainly
“discerned that in her which
“may clearely confirme what
“the Comets and Sunne spots
“doe seeme to prove, *viz.* that
“the heavens are not solid,
“nor freed from those changes
“which our aire is liable unto,
“for about the Moone I percei-
“ved such an orbe of vaporous
“aire, as that is which doth en-
“compasse our earth, and as va-
“pours and exhalations, are rai-
“sed from our earth into this
“aire, so are they also from
“the Moone.

You see what probable
grounds

grounds and plaine testimonies I have brought for the confirmation of this Proposition : many other things in this behalfe might be spoken, which for brevity sake I now omit, and passe unto the next.

Proposition 13.

That 'tis probable there may be inhabitants in this other World, but of what kinde they are is uncertaine.

I Have already handled the Seasons and Meteors belonging to this new World: 'tis requisite that in the next place I should come unto the third thing which I promised, and to say somewhat of the inhabitants, concerning whom there might be many difficult questions raised, as whether that place be more inconvenient for habitation

tion then our World (as *Keplar* thinkes) whether they are the seed of *Adam*, whether they are therein a blessed estate, or else what meanes there may be for their salvation, with many other such uncertaine enquiries, which I shall willingly omit, leaving it to their examination, who have more leisure and learning for the search of such particulars.

Being for mine own part content only to set downe such notes belonging unto these which I have observed in other Writers. *Cum tota illa regio nobis ignota sit, remanent inhabitatores illi ignoti penitus*, (saith *Cusanus*) since we know not the regions of that place, wee must be altogether ignorant of the inhabitants. There hath not yet beene any such discovery concerning these, upon which wee may build a certainty, or good probability: well may wee guesse at them, and that

De dec.
ig. l. 2.
c. 12.

that too very doubtfully, but we can know nothing, for if we doe hardly guesse aright at things which be upon earth, if with labour wee doe finde the things that are at hand, how then can wee search out those things that are in Heaven? What a little is that which wee know? in respect of those many matters contained within this great Universe, this whole globe of earth and water? though it seeme to us to be of a large extent, yet it beares not so great a proportion unto the whole frame of Nature, as a small sand doth unto it; and what can such little creatures as wee discern, who are tied to this point of earth? or what can they in the Moone know of us? If wee understand any thing (saith *Esdra*) 'tis nothing but that which is upon the earth, and hee that dwelleth above in the Heavens, may onely understand

Wisd.9.16.

2Esd.4.22.

stand the things that are above in the height of the heavens.

So that 'twere a very needlesse thing for us, to search after any particulars, however, wee may guesse in the generall, that there are some inhabitants in that Planet: for why else did Providence furnish that place with all such conveniences of habitation as have beene above declared?

But you will say, perhaps, is there not too great and intolerable a heate, since the Sunne is in their Zinith every moneth, and doth tarry their so long before hee leaves it?

I answer, 1. This may, perhaps, be remedied (as it is under the line) by the frequencie of mid-day showers, which may cloud their Sunne, and coole their earth: 2. The equality of their nights doth much temper the scorching of the day, and the extreme cold that comes from

from the one, require some space before it can be dispelled by the other, so that the heate spending a great while before it can have the victory, hath not afterwards much time to rage in. Wherefore notwithstanding this, yet that place may remaine habitable. And this was the opinion of the *Cardinal de cusa*, when speaking of this Planet, he saies, *Hic locus Mundi est habitatio hominum & animalium atq; vegetabilium.* "This part of the world is inhabited by men and beasts, and Planets. To him assented *Campanella*, but hee cannot determine whether there were men, or rather some other kinde of creatures. If they were men, then he thinkes they could not be infected with *Adams* sinne; yet, perhaps, they had some of their owne, which might make them liable to the same misery with us, out of which, perhaps, they were delivered

De dest.
ign. l. 2.
c. 12.

Eph. I. 10.

Col. I. 20.

livered by the same means as we, the death of Christ, and thus he thinkes that place of the *Ephesians* may be interpreted, where the Apostle saies, *God gathered all things together in Christ, both which are in earth, and which are in the heavens* : So also that of the same Apostle to the *Colossians*, where hee saies, that *it pleased the Father to reconcile all things unto himselfe by Christ, whether they be things in earth, or things in heaven.*

But I dare not jest with Divine truthes, or apply these places according as fancy directs. As I thinke this opinion doth not any where contradict Scripture, so I thinke likewise, that it cannot be proved from it, wherefore *Campanella's* second conjecture may be more probable, that the inhabitants of that world, are not men as wee are, but some other kinde of creatures which beare some proportion

portion and likenesse to our natures, and *Cusanus* too thinkes they differ from us in many respects; I will set downe his words as they may bee found in the abovesaid place, *Suspicamus in regione solis magis esse solares, claros & illuminatos intellectuales habitatores, spiritualiores etiam quam in lunâ, ubi magis lunatici, & in terra, magis materiales, & crassi, ut illi intellectualis nature solares sint multum in actu & parum in potentia; terræ verò magis in potentia, & parum in actu, lunares in medio fluctuantes. Hoc quidem opinamur ex influentia ignis solis aquatica simul & aeris lune, & gravedine materiali terræ, & consimiliter de aliis stellarum regionibus suspicantes, nullam habitatoribus carere, quasi et sint partes particulares mundiales unius universi, quot sunt stellæ quarum non est numerus, nisi apud eum qui omnia in numero creavit.*

“ Wee may conjecture (saith
“ he) the inhabiteurs of the Sunne
“ are like to the nature of that
“ Planet, more cleare and bright,
“ more intellectuall and spiri-
“ tuall than those in the Moone
“ where they are neerer to the
“ nature of that duller Planet,
“ and those of the earth being
“ more grosse and materiall
“ than either, so that these in-
“ tellectuall natures in the Sun,
“ are more forme than matter,
“ those in the earth more mat-
“ ter than forme, and those
“ in the Moone betwixt both.
“ This wee may guesse from the
“ fiery influence of the Sunne,
“ the watery and aereous influ-
“ ence of the Moone, as also
“ the matercall heavinessse of the
“ earth. In some such manner
“ likewise is it with the regions
“ of the other Starres, for wee
“ conjecture that none of them
“ are without inhabitants, but
“ that there are so many particu-
“ lar

“lar worlds and parts of this
 “one universe, as there are Stars
 “which are innumerable, unlesse
 “it bee to him who created all
 “things in number.

For he held that the stars were not all in one equall Orbe as we commonly suppose, but that some were farre higher than others which made them appeare lesse, and that many others were so farre above any of these, that they were altogether invisible unto us. An opinion (which as I conceive) hath not any great probability for it, nor certainty against it.

The Priest of *Saturne* relating to *Plutarch* (as he faignes it) the nature of the Selenites, told him they were of divers dispositions, some desiring to live in the lower parts of the Moone, where they might looke downwards upon us, while others were more surely mounted aloft, all of them shining like the rayes of

O 2

the

the Sun, and as being victorious as crowned with garlands made with the wings of *Eustachia* or *Constancie*.

Nat. Com.
lib. 3. c. 19.

It hath beene the opinion amongst some of the Ancients, that their Heavens and Elysian fields were in the Moone where the aire is most quiet and pure. Thus *Socrates*, thus *Plato*, with his followers, did esteeme this to bee the place where those purer soules inhabit, who are freed from the Sepulchre, and contagion of the body. And by the Fable of *Ceres*, continually wandering in search of her daughter *Proserpina*, is meant nothing else but the longing desire of men, who live upon *Ceres* earth, to attaine a place in *Proserpina*, the Moone or Heaven.

Plutarch also seemes to assent unto this, but hee thinkes moreover, that there are two places of happinesse answerable to those two parts which hee fancies to

remaine of a man when hee is dead, the soule and the understanding; the soule he thinkes is made of the Moone, and as our bodies doe so proceede from the dust of this earth, that they shall returne to it hercafter, so our soules were generated out of that Planet, and shall bee resolved into it againe, whereas the understanding shall ascend unto the Sunne, out of which it was made where it shall possesse an eternity of well being, and farre greater happineffe than that which is enjoyed in the Moone. So that when a man dies, if his soule bee much polluted, then must it wander up and downe in the middle region of the aire where hell is, and there suffer unspeakable torments for those sinnes whereof it is guilty. Whereas the soules of better men, when they have in some space of time beene purged from that impurity which they did derive from the body,

then doe they returne into the Moone, where they are posselt with such a joy, as those men feele who professe holy misteries, from which place (saith he) some are sent downe to have the superintendance of Oracles, being diligent either in the preservation of the good, either from or in all perils, and the prevention or punishment of all wicked actions, but if in these employments they mis-behave themselves, then are they againe to be imprisoned in a body, otherwise they remaine in the Moone till their body be resolved into it, & the understanding being cleared from all impediments, ascends to the Sunne which is its proper place. But this requires a diverse space of time according to the divers affections of the soule. As for those who have beene rectified and honest, addicting themselves to a studious and quiet life, these are quickly preferred to a higher

higher happineſſe. But as for ſuch who have buſied themſelves in many broyles, or have beene vehement in the proſecution of any luſt, as the ambitious, the amorous, the wrathfull man, theſe ſtill retaine the glimpses and dreames of ſuch things as they have performed in their bodies, which makes them either altogether unfit to remaine there where they are, or elſe keepes them longer they can put off their ſoules. Thus you ſee *Plutarchs* opinion concerning the inhabitants and neighbours of the Moone, which (according to the manner of the Academickes) hee delivers in a third perſon; you ſee he makes that Planet an inferior kind of heaven, and though hee differ in many circumſtances, yet doth hee deſcribe it to be ſome ſuch place, as wee ſuppoſe Paradife to be. You ſee likewise his opinion concerning the place of damned ſpirits,

rits, that it is in the middle region of the aire, and in neither of these is hee singular, but some more late and Orthodox Writers have agreed with him. As for the place of hell, many thinke it may be in the aire, as well as any where else.

*De civit.
Dei. lib. 22.
ca. 16.*

Mat. 25. 30

Eph. 4. 9.

True indeed, Saint *Austin* affirms that this place cannot bee discovered; But others there are who can shew the situation of it out of Scripture; Some holding it to bee in some other world without this, because our Saviour calls it *σκοτεινὴ ἐξώτερον*, outward darkenesse. But the molt will have it placed towards the Center of our earth, because 'tis said, Christ descended into the lower parts of the earth, and some of these are so confident, that this is its situation, that they can ascribe you its bignesse also, and of what capacity it is. *Francis Ribera* in his *Comment on the Revelations*, speaking of those words,

words, where 'tis said, that the blood went out of the Wine-
presse, even unto the horses brid-
les by the space of one thou-
sand and sixe hundred furlongs,
interprets them to bee meant of
Hell, and that that number ex-
presses the diameter of its conca-
vity, which is 200 *Italian* miles;
but *Lessius* thinkes that this opi-
on gives them too much roome
in hell, and therefore hee guesse
that 'tis not so wide; for (saith
hee) the diameter of one league
being cubically multiplied, will
make a spheare capable of
800000 millions of damned bo-
dies, following to each sixe foote
in the square, whereas (saies hee)
'tis certaine that there shall not
be one hundred thousand milli-
ons in all that shall bee damned.
You see the bold *Iesuit* was care-
full that every one should have
but roome enough in hell, and
by the strangeness of the conje-
cture, you may guesse that he had
rather

Rev. 14. 20.

*De Morib.
div. l. 13.
c. 24.*

rather bee absurd, than seeme either uncharitable or ignorant. I remember there is a relation in *Pliny*, how that *Dionisiodorus* a Mathematician, being dead, did send a letter from his place to some of his friends upon earth, to certifie them what distance there was betwixt the center and superficies: hee might have done well to have prevented this controverſie, and enformed them the utmost capacity of that place. However, certaine it is, that that number cannot bee knowne, and probable it is, that the place is not yet determined, but that hell is there where there is any tormented soule, which may bee in the regions of the aire as well as in the center; but of this onely occasionally, and by reason of *Plutarchs* opinion concerning those that are round about the Moone; as for the Moone it selfe, hee esteemes it to bee a lower kinde of Heaven, and therefore

therefore in another place hee
cals it a terrestraill starre, and an
Olympian or celestiall earth an-
swerable, as I conceive, to the
paradise of the Schoolemen, and
that Paradise was either in or
neere the Moone, is the opinion
of some later Writers, who de-
rived it (in all likelihood) from
the assertion of *Plato*, and per-
haps, this of *Plutarch*. *Tostatus*
laies this opinion upon *Isiodor*.
Hispalensis, and the venerable
Bede; and *Peterius* fathers is up-
on *Strabus* and *Rabanus* his Ma-
ster. Some would have it to bee
situated in such a place as could
not be discovered, which causes
the penman of *Ejdras* to make it
a harder matter to know the out-
goings of Paradise, then to weigh
the weight of the fire, or measure
the blasts of wind, or call againe
a day that is past. But notwith-
standing this, there bee some o-
thers who thinke that it is on the
top of some high mountaine un-
der

Cursilens
oracula.

S. IV. Ram.
lib. I. cap 3.
S 7.
in Gen.

2 *Esd.* 4. 7.

In Genes.

der the line, and these interpreted the torrid Zone to be the flaming Sword whereby Paradise was guarded. 'Tis the consent of divers others, who agree in this, that Paradise is situated in some high and eminent place. So *Testatus: Est etiam Paradisus situ altissima, supra omnem terrae altitudinem,* "Paradise is situated in "some high place above the "earth : and therefore in his *Cóment* upon the 49. of *Genesis*, hee understandes the blessing of *Jacob* concerning the everlasting hills to bee meant of Paradise, and the blessing it selfe to bee nothing else but a promise of Christs comming, by whose passion the gates of Paradise should bee opened. Unto him assented *Rupertus, Scotus*, and most of the other Schoolemen, as I find them cited by *Pererius*, and out of him in *Sr. W. Rawleigh*. Their reason was this : because in probability this place was not overflowed by

Comment. in
2. Gen. v. 8.
lib. 1. cap. 3.
 § 67.

by the flood, since there were no sinners there which might draw the curse upon it. Nay *Tostatus* thinks that the body of *Enoch* was kept there, and some of the Fathers, as *Tertullian* and *Austin* have affirmed, that the blessed soules were reserved in that place till the day of judgement, and therefore 'tis likely that it was not overflowed by the flood; and besides, since all men should have went naked if *Adam* had not fell, 'tis requisite therefore that it should be situated in some such place where it might bee priviledged from the extremities of heat and cold. But now this could not bee (they thought) so conveniently in any lower, as might in some higher aire. For these and such like considerations have so many affirmed that Paradise was in a high elevated place, which some have conceived could bee nowhere but in the Moone. For
it

it could not be in the top of any mountaine, nor can we thinke of any other body separated from this earth which can bee a more convenient place for habitation than this Planet, therefore they concluded that it was there.

It could not bee on the top of any mountaine.

Gen. 7. 19.

1. Because wee have expresse Scripture, that the highest of them was overflowed.

2. Because it must bee of a greater extension, and not some small patch of ground, since 'tis likely all men should have lived there, if *Adam* had not fell. But for a satisfaction of these arguments, together with a farther discourse of Paradise, I shall referre you to those who have written purposely upon this subject. Being content for my owne part to have spoken so much of it, as may conduce to shew the opinion of others concerning the inhabitants of the
Moone

Moone, I dare not my selfe affirm any thing of these Selenites, because I know not any ground whereon to build any probable opinion. But I thinke that future ages will discover more; and our posterity, perhaps, may invent some meanes for our better acquaintance with these inhabitants. 'Tis the method of providence not presently to shew us all, but to lead us a long from the knowledge of one thing to another. 'Twas a great while ere the Planets were distinguished from the fixed Stars, and sometime after that ere the morning and evening starre were found to bee the same, and in greater space I doubt not but this also, and farre greater mysteries will bee discovered. In the first ages of the world the Islanders either thought themselves to be the onely dwellers upon the earth, or else if there were any other, yet they could not possibly

sibly conceive how they might have any commerce with them, being severed by the deepe and broad Sea, but the after-times found out the invention of ships, in which notwithstanding none but some bold daring men durst venture, there being few so resolute as to commit themselves unto the vaste Ocean, and yet now how easie a thing is this, even to a timorous & cowardly nature? So, perhaps, there may be some other meanes invented for a conveyance to the Moone, and though it may seeme a terrible and impossible thing ever to passe through the vaste spaces of the aire, yet no question there would bee some men who durst venture this as well as the other. True indeed, I cannot conceive any possible meanes for the like discovery of this conjecture, since there can bee no sailing to the Moone, unlesse that were true which the Poets doe but feigne,
that

that shee made her bed in the Sea. We have not now any *Drake* or *Columbus* to undertake this voyage, or any *Dadalus* to invent a conveyance through the aire. However, I doubt not but that time who is still the father of new truths, and hath revealed unto us many things which our Ancestours were ignorant of, will also manifest to our posterity, that which wee now desire, but cannot know. *Veniet tempus* (saith *Seneca*) *quo ista quæ nunc latent, in lucem dies extrahet, & longioris ævi diligentia.* Time will come when the indeavours of after-ages shall bring such things to light, as now lie hid in obscurity. Arts are not yet come to their Solstice, but the industry of future times assisted with the labours of their forefathers, may reach unto that height which wee could not attaine to. *Veniet tempus quo posterit nostri nos tam aperta nescisse*

Nat. Quest.
l. 7. c. 25.

mirentur. As wee now wonder at the blindnesse of our Ancestors, who were not able to discerne such things as seeme plaine and obvious unto us. So will our posterity admire our ignorance in as perspicuous matters. *Keplar* doubts not, but that as soone as the art of flying is found out, some of their Nation will make one of the first colonies that shall inhabite that other world. But I leave this and the like conjectures to the fancie of the reader; Desiring now to finish this Discourse, wherein I have in some measure proved what at the first I promised, a world in the Moone. However, I am not so resolute in this, that I thinke tis necessary there must be one, but my opinion is that 'tis possible there may be, and tis probable there is another habitable world in that Planet. And this was that I under-

undertooke to prove. In the pursuit whereof, if I have shewed much weaknesse or indiscretion; I shall willingly submit my selfe to the reason and censure of the more judicious.

P 2

The



The Propositions that are proved in this Discourse.

Proposition 1.

That the strangeness of this opinion is no sufficient reason why it should be rejected, because other certaine truths have beene formerly esteemed ridiculous, and great absurdities entertrayned by common consent.

By way of Preface.

Prop. 2.

*That a plurality of worlds doth not
contradict any principle of rea-
son or faith.*

Prop. 3.

Prop. 3.

That the heavens doe not consist of any such pure matter which can priviledge them from the like change and corruption, as these inferior bodies are liable unto.

Prop. 4.

That the Moone is a solid, compacted, opacous body.

Prop. 5.

That the Moone hath not any light of her owne.

Prop. 6.

That there is a world in the Moone, hath beene the direct opinion of many ancient, with some moderne Mathematicians, and may probably be deduced from the tenents of others.

Prop. 7.

Prop. 7.

That those spots and brighter parts which by our sight may be distinguished in the Moone, doe shew the difference betwixt the Sea and Land in that other World.

Prop. 8.

That the spots represent the Sea, and the brighter parts the Land.

Prop. 9.

That there are high Mountaines, deepe vallies, and spacious plains in the body of the Moone.

Prop. 10.

That there is an Atmo-sphera, or an orbe of grosse vaporous aire, immediately encompassing the body of the Moone.

Prop. 11.

Prop. 11.

*That as their world is our Moone,
so our world is their Moone.*

Prop. 12.

*That tis probable there may bee
such Meteors belonging to that
world in the Moone, as there are
with us.*

Prop. 13.

*That tis probable there may be in-
habitants in this other World,
but of what kinde they are is un-
certaine.*

FINIS.

